Chagrin River Watershed Partners, Inc.

Monitoring Permeable Pavers at

Willoughby Hills Community Center

June 13, 2013

Chagrin River Watershed Partners

- Formed in 1996 by watershed communities. Supported by member dues and grants.
- Work directly with 37 cities, villages, counties, townships, and park districts to minimize flooding and erosion as communities grow.
- Focus on improving development practices and site design to reduce long term infrastructure costs.
- Majority of members required to comply with Ohio EPA's Phase II requirements.

CRWP Monitoring of Willoughby Hills Community Center Stormwater Retrofit

- Overview of CRWP NERR Science Collaborative Project
- Willoughby Hills Community Center Stormwater Retrofit Project
- CRWP Monitoring Plan & Outreach

Benefits of Innovative Stormwater Practices

- Promote infiltration and uptake by plants
- Reduce flooding
- Reduce stream erosion by reducing flow
- Improve habitat for aquatic life
- Temperature control for streams
- Pollution removal

How Did We Get Here?

- Model Regulations for Comprehensive Stormwater Management
- CRWP constructed and monitored demonstration projects with USEPA Grant to demonstrate low impact development (LID) Projects
- Modeling work with ODNR
  - Stormwater modeling showed annual runoff volumes reduced up to >50%
  - Disconnecting impervious area and bioretention best for residential areas
  - Pervious pavement and bioretention best for commercial sites.
- Applied for NERR-SC grant in 2010

National Estuarine Research Reserve (NERR) System Science Collaborative

- NOAA Funds administered by the University of New Hampshire
- Science-based research to address local coastal management problems.
- Researchers and intended users work together.

CRWP NERR Science Collaborative Project

Modeling peak discharge and runoff reduction using local case studies and provide training on methods and results.

- Quantify BMP specific and site level hydrology for local soil and climate characteristics.
- Design of 4 innovative stormwater BMPs
- Monitoring 6 innovative stormwater BMPs
- Modeling under current and future precipitation regimes
- Develop implementation tools

Site Characterization: Single ring infiltrometer test of in situ soil conditions

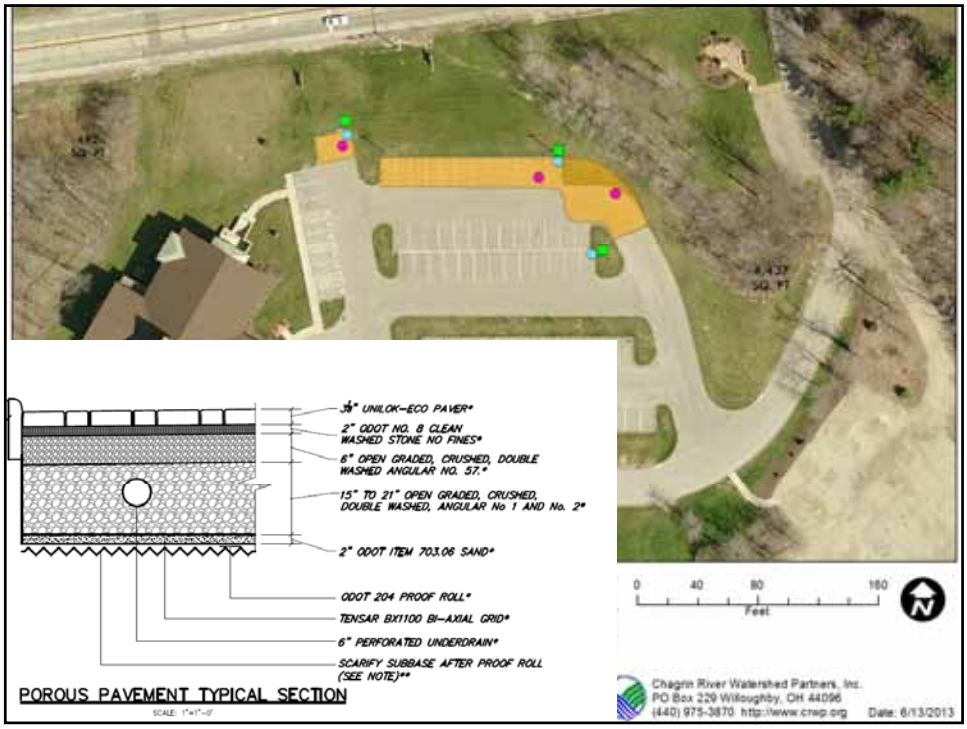
How will we use the data?

- Assess hydrology of systems and use information to update state guidance on pervious pavements.
- Use monitoring data and modeling from this project to inform state, regional, and local regulations, policies, and credit programs.
- Collect additional information on rate of clogging of pervious pavement systems.

Possible Monitoring Sites

Reviewed & visited approximately 35 sites

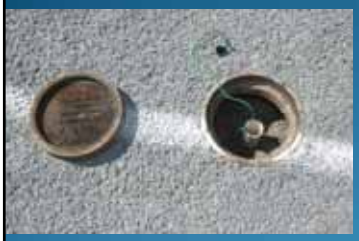
1. Willoughby Hills Community Center: Pervious Pavers
2. Perkins Township: Porous Concrete
3. Old Woman Creek NERR: Pervious asphalt
4. Pepper Pike: Pervious Pavers
5. Orange Village Bioretention and Pavers
6. Holden Arboretum Bioretention



Willoughby Hills Community Center

- Propose to monitor both bays of pervious pavers
  - Hydrology (flow of water) through systems
  - Water quality samples
- Monitoring to determine appropriate maintenance.
- Host trainings and meetings highlighting this site and the data from monitoring.

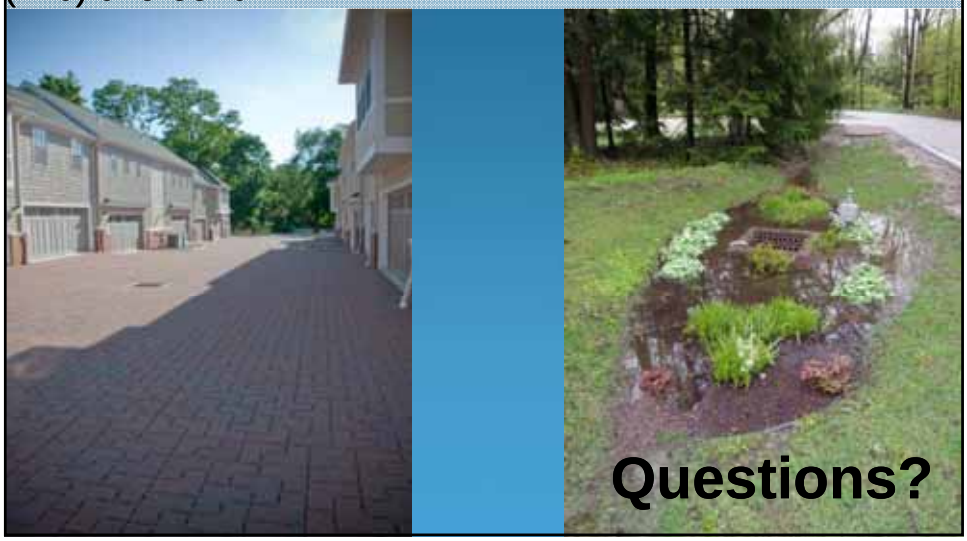
Monitoring Equipment



Weather Station

- Typically used to estimate evapotranspiration
- Sensors needed (at a minimum):
  - Temperature
  - Relative humidity
  - Solar radiation
  - Wind speed
  - Rainfall

CRWP Needs for Monitoring

- Construction oversight to ensure installation is per the plan details.
- CRWP needs to be involved throughout construction process.
- Infiltration testing after area excavated.
- Coordination on monitoring equipment installation
- Records of maintenance on site
- Access to site for photographs and downloading data.

Amy H. Brennan
Chagrin River Watershed Partners, Inc.
abrennan@crwp.org
(440) 975-3870