

Group Report-Out – PAYING FOR URBAN FLOOD RISK REDUCTION

Urban Flooding Definition

The Urban Flooding Awareness Act defines urban flooding as “the inundation of property in a built environment, particularly in more densely populated areas, caused by rainfall overwhelming the capacity of drainage systems, such as storm sewers. ‘Urban flooding’ does not include flooding in undeveloped or agricultural areas. ‘Urban flooding’ includes (i) situations in which stormwater enters buildings through windows, doors, or other openings, (ii) water backup through sewer pipes, showers, toilets, sinks, and floor drains, (iii) seepage through walls and floors, and (iv) the accumulation of water on property or public rights-of-way.”

Urban flooding is characterized by its repetitive, costly and systemic impacts on communities, regardless of whether or not these communities are located within formally designated floodplains or near any body of water. In an urban environment, any of the issues described below can independently or in combination cause urban flooding, impacting vital infrastructure with increasing consequences in more densely populated areas.

Mitigation of these impacts requires an understanding of the root causes. These may include:

High groundwater/ saturated soils

- Basements located in saturated, poorly drained soils are likely to experience seepage.

Aging and Inadequate Storm Sewers

- *Combined sewer capacity exceeded:* Older areas of communities may have combined sanitary and storm sewers, which can be overwhelmed during precipitation events.
- *Storm sewer capacity is exceeded:* Storm sewers are designed to convey specified precipitation events that, if exceeded, will result in water ponding in streets, yards, public right of ways and potentially entering structures through lowest openings.
- *Storm sewers that cannot drain due to flooded open channel receptors:* During major precipitation events impacting a larger geographic area, receiving rivers and streams may rise to a depth which prevents the discharge from storm sewer outlets, even to the extent of backflow through the sewer system.

Out of bank flow from rivers, streams, and lakes

- Overbank flooding is a natural process that occurs when rivers, streams, and lakes flow outside of their banks. In an urban setting, this natural process can be exacerbated by development pressures, leading to frequent and chronic flooding.

Impervious surfaces

- As more land is converted to urban and suburban areas, the amount of surface area available for water infiltration into the soils decreases.

Inadequate site drainage

- In an urban setting, overland water paths may not be provided or can be obstructed by development, causing localized drainage problems that lead to flooding.

Climate uncertainty

- Increasing frequency and intensity of weather events are placing more pressure on urban drainage systems.

In the context of the above, what is your opinion on the following?

HOW TO PAY FOR URBAN FLOOD RISK REDUCTION

- Q1 – What funding measures have proven successful? (in the UFAA survey communities noted overhead sewer cost share programs as very successful)
- Q1b – What are good methods to encourage Private-Public Partnerships (Insurance industry, developers, health departments, realtors, etc.)
- Q2 – What are the impediments to establishing a stormwater utility in communities with urban flooding?
- Q2b – Should the General Assembly explicitly grant non-home rule communities the power to establish stormwater utility fees? Statutory authority for all government categories (cities/towns/sewer districts, watershed districts)? (Would like this to be considered for a consensus point.)
- Q3 – Is it economical for Insurance Companies to invest in urban flood risk reduction measures to reduce claims?
- Q3b – Should Insurance cover urban flood risk?
- Q4 – What level of government is best suited to deal with funding efforts to reduce urban flood risk?
- Q4b – Are government funds / subsidies appropriate for reducing urban flood risk?
- Q5 – What level of flood risk is acceptable? How frequent? How severe?
- Q5b – Should nuisance flooding be reduced at tax payer expense?

Question #1 – What funding measures have proven successful?

§ Positions

- Tax credit option? (like low income housing) – investors willing to invest from the private side to get the credits. Could be used new or rehab construction.
- New markets tax credit?
- Stormwater utility – brings awareness to general public and increases their expectations of what the City will do for residents. Eventually pay for itself.
- Cost share program between City and residents for nuisance flooding.
- Problem on private property – responsibility of homeowner to increase their return on investment.
- Developer can address issues easier on the front end, compared to the City trying to fix problems in the future. More efficient to address lots of problems at once instead of one at a time. New development fix existing problems in the areas.
- Transportation and other infrastructure improvement projects – pair up with other problems and fix them together more efficiently. Stovepiped organizations not communication needs to be addressed. Multi purpose projects – two for one, other funding sources become available that way, and much more efficient. (pays for itself through efficiency)
- Cost share works better with middle to upper income neighborhoods. Combining individual owners together to share the cost is efficient. Multi-homeowners (like condo association).
- Don't push the problem off of one property onto the adjacent property.
- Gambling revenue?
- Taxes

- Special service areas (façade improvements, clean up litter on streets are examples of existing services). Home owners associations are also similar. Chambers of commerce initiates this kind of thing.
- Compensation by developers for problems in other neighborhoods.

Unsuccessful Funding Measures:

- Green infrastructure Grant programs bring awareness, but aren't reducing actual flood risk. Need to be better at marketing what they are good for. These programs and intended results are not well understood by the recipients.
- Grants become a crutch and cause real problems to not be integrated into long term infrastructure improvement investment.
- State revolving funds not being tapped into. Not part of a comprehensive planning process. Hit and miss, done and gone from memory, check off a box and move on, but problems still exist.
- Stormwater utilities don't have high enough fees to make a real difference in the problems. People just pay the fees to get out of making real improvements on their properties. Too many credits undercut the ability of the program to collect sufficient funds to be used for significant projects. Communities are starting to target the big developments instead of homeowners for stormwater utility fees. Churches are big opponents to utility fees and don't think they should be subject to the fees.
- Communities not having dialogue about level of service and who needs to pay for certain levels of service.
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§ Discussion

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§ Consensus

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§ Actions

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Question #1b – What are good methods to encourage Private-Public Partnerships (Insurance industry, developers, health departments, realtors, etc.)

§ Positions

- Stormwater Utilities – are the communities thinking they would eventually increase the fees over time after initial implementation?
- Real estate investment trusts would rather pay the stormwater utility fees instead of pay for projects themselves. Most complaints are from residents.
- Dependable revenue stream is needed for investors to be interested.
- Credits for taxes and or stormwater utility credits
- Higher level of government service expected by private partners or reduced permitting fees/red tape to encourage the PP partnership.
- Reduced insurance cost savings could be reinvested by insurance partners.
- Regulations to require certain stormwater investment by private development push stormwater infrastructure funding onto the private sector for new development, but doesn't fix existing problems that existed before the regulations.
- Performance based contracting to fix existing problems.
- Automotive industry – seat belts, air bags – insurance industry pushed for these safety improvements, they didn't pay for them though (the consumers do). Encourage PP partnerships that do the same thing.
- Resilience incentive. Reduce loss of business revenue by fixing stormwater problems that would close a business.

§ Discussion

- What level of partnership – individual homeowners up to big companies or investment firms.
- Needs need to be identified by someone – the local community.

- Community coordination with business (like malls) to solve problems together instead of operating independently.
- Cost share programs – property owners aren't aware of the programs and don't know what kind of improvements they could make that would actually help themselves. Need educations.
- Some people don't want to deal with the problems because they can't afford to pay or would rather deal with the problems as they happen instead of invest for future.
- Expedited loan process
- Change rules to facilitate green infrastructure projects that aren't eligible for certain kinds of funding.

§ Consensus

- Credits
- Planning
- Education
- Wetland bank concept for selling stormwater storage

§ Actions

- Requires education of PPP

Question #2 – What are the impediments to establishing a stormwater utility in communities with urban flooding?

§ Positions

- Political will
- Churches (and other tax exempt entities) – philosophically opposed. Zoning changes could help soften the blow (they could be exempt from large parking lots, thus have lower stormwater utility fee)
- Grants as bribes to retrofit parking lots, etc, then implement the utility fees after updates are built.
- Donation tax credit – give churches an incentive to donate their parking lots for other use in exchange for a credit.
- Uncoordinated codes are a problem.
- Poorly planned and unmet expectations
- Lack of understanding about stormwater utility – some consider it a “rain tax” that they can't control. It also creates an expectation of higher service from city since fee being paid.
- Lack of understanding what our interests are – need interest-based discussion to start mediation and collaboration. (Elmhurst, IL is example of flooding problems being addressed and resulting in national magazines naming it the best community to live in).

§ Discussion

- Churches are just like any other business, with financial incentives. How does this kind of activity increase their membership and contributions?
- One church saw that the people around the neighborhood are suffering – saw it as their civic duty to fix flooding problem so the neighbors were helped, donated their land for detention basin.
- Appeal to church's higher moral imperative to help their neighbors and be a proper steward of the environment/land.
- Expedited permitting as an incentive.
- Use CRS rating to base federal funding levels.
- Create state framework for stormwater utility instead of having every single community deal with it on their own. Takes the heat off of the local community officials – they can blame other lawmakers.
- Sell stormwater storage like solar power generators can sell back to the electric utility. Like a wetland bank.
- Illinois has low number of stormwater utilities (less than 20) compared to surrounding states (hundreds).

- Fees based on water usage (or flat fee) on water bill instead of stormwater utility. There are a number of communities in Illinois do this instead of as a utility. But this can't keep the funds safe from other uses (much like gambling funds meant for schools that don't actually go to schools anymore).
- Rebate program for low income households is used in some communities.
- Technology has reduced some of the impediment to calculation of fees by making it easier to measure how much impervious area exists.
- All pay same regardless of home value.

§ Consensus

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§ Actions

- Create interest-based discussion

Question #2b – Should the General Assembly explicitly grant non-home rule communities the power to establish stormwater utility fees? Statutory authority for all government categories (cities/towns/sewer districts, watershed districts)?

§ Positions

- For municipalities, there is already authority for utilities and fees, but not for Counties. Dupage and _____
- Special districts do not have authority.

§ Discussion

- Multiple districts (overlapping) having stormwater fees needs to be avoided.
- Allowing counties to assist communities should be allowed.
- All MS-4 communities are subject to the same requirements, no matter if it is a county entity or a municipal entity. This isn't fair because funding sources between the two kinds of government are different and not compatible.
- Stormwater utility fees are not enforceable.
- Animosity between municipalities and counties can sometimes be very strong and drive the authority issue more than what's best for either the municipalities or the counties.
- Illinois is one of 6 states left in the union that doesn't have statewide authority for stormwater utilities.
- Drainage districts deal with stormwater issues in the rural and agricultural areas, but many are now obsolete (historic) and services are being provided by other entities now in urbanizing areas.
- Fee vs Tax (sometimes one makes more sense than the other)
- Authority vs Mandate (grant authority to counties, but don't mandate implementation of utility)
- Transportation tax is an example of drivers paying for all roads, not just the ones they drive on – this helps residents understand the stormwater utility model.
- Having Stormwater utility Improves bond ratings because it is a stable source of funds.
- Need sustainable plan that keeps up with rising prices and expenses.
- Inter-governmental authorities (IGA's) could be authorized where needed.

§ Consensus

- General Assembly should change the law to give Counties the authority to establish stormwater utilities.
- Authority has to tie back to service.
- Need a dedicated funding source.

§ Actions

- Overcome fear of too much authority being given to counties.
- Enables bonding borrowing.
- Drainage districts (and other government entities) work with counties thru inter-governmental agreements (IGA's).

Question #3 – Is it economical for Insurance Companies to invest in urban flood risk reduction measures to reduce claims?

§ Positions

- Insurance companies are for profit, not to lose money.
- Discount to insurance as incentive to change behavior.
- Safety aspect (insurance institute for business and home safety)
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§ Discussion

- Compare to automotive industry – national scale
- Local scale for insurance is a different story and not same paradigm.
- Studies and research that could lead to reduced costs – realtors or lenders to fund.
- Two pronged triggers – underwriting and _____
- Cost prohibitive for insurance to cover water backup or flooding, which is why it's a separate coverage.
- Make water/flooding mandatory coverage for all homes everywhere to spread out the risk/cost.
- People don't understand their homes and how their equipment works.
- Assumption (wrong?) that reduced claims is an incentive. Reducing cost is the true incentive to insurers.
- Who's responsibility is it to educate property owners.
- Insurance companies could reduce premiums for good behavior.
- Discounts incentivized by linking to neighborhood improvements or multiple neighbors.
- Future costs are estimated based on historical losses. Improvements in neighborhoods take a long time to show up as improvements of the overall history.
- Data analyzed by zip code because it is easiest to acquire, but neighborhood improvements won't show up when aggregated with whole zip codes.
- Insurance data should be available at a more refined level (census tract level) to make it more useful.
- FEMA flood insurance is not part of CLUE, so it doesn't show up to prospective property owners or other insurance companies. Seller needs to tell the truth or there is no other way for others to know if FEMA insurance existed on the property.
- Banks not required to report flood losses, etc. for seized or foreclosed properties.

§ Consensus

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§ Actions

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Question #3b – Should Insurance cover urban flood risk?

§ Positions

- Yes, it is covered today through NFIP.
- How to get low to moderate risk properties to purchase?
- It is available in the private market, but certain losses are not covered.
- If it was profitable, then it would already be offered as a product.
- Flood event must be 2 or more acres and 2 or more properties before NFIP coverage kicks in.
- Seepage not covered, it is a maintenance issue. Sewer back up is covered.

§ Discussion

- Rule enforcement is a problem. Cities (or zoning) don't make people change or fix problem. (repetitive loss)
- Should NFIP coverage be actuarially determined? Most people don't know it isn't.
- Federal disaster assistance is still available to properties that don't have flood insurance. Political will issue. Should change the law so that Fed disaster assistance is contingent on purchase of flood insurance.
- Structure with below-grade occupancy – should it have mandatory insurance?
- Make flood insurance contingent on owning the house, not on having a mortgage.

- Unfair to mandate insurance to properties that don't need it – it becomes a subsidy to those who do need it.
- Social inequity for basement apartment dwellers/renters. No insurance available in certain situations.
- Knowledge of flooding problems is sensitive and property owners don't want others to know about it because it will affect their ability to sell or property value. This protects the current owners, but not the future owners. Litigation issues arise on both sides of the situation.
- Repetitive loss information is available to CRS communities, by address and by \$ amount (used to be released annually).
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Consensus

- If property gets \$ assistance (fed, state, local) require flood insurance.
- Provide notification for rental disclosure.

§ Actions

- Need to educate on risk and insurance.
- Require transparency in transactions.

Question #4 – What level of government is best suited to deal with funding efforts to reduce urban flood risk?

§ Positions

- Preventative – local (loan administered by state)
- Large disaster – Federal assistance
- What is the public interest, not just who should pay.
- Transportation project could be used for flooding mitigation issues. Education projects (schools) could be used to add detention basins to school properties to mitigate problems. Existing funding sources used for broader thinking about projects. Policy level changes to allow funds to be spent on new aspects of projects that would mitigate problems.
- Levels of government is not the issue. Quasi-governmental entities can be created to address specific needs. Example: MWRDGC and the deep tunnel project which was to reduce basement flooding in Chicago. MWRDGC didn't even exist at the time and was created to address problems.
- Sales tax on purchase of paving material. Like a "sin" tax. This would incentivize better design and maintenance and add revenue to mitigation programs/projects.
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§ Discussion

- Manage to the hydraulic grade line (vertical) instead of trying to map the horizontal flooding footprint.

§ Consensus

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§ Actions

- All projects at all levels should consider stormwater issues and stormwater mitigation.
- Change the marketplace to incentivize or disincentise behaviors.
- Local role
- Tax on impervious paving
- Tax breaks on pervious pavement or other steps to reduce risk (rain barrels).

Question #4b – Are government funds / subsidies appropriate for reducing urban flood risk?

§ Positions

- Already do through stormwater utilities.
- Tax break is a form of subsidy.

- Pre-FIRM structure insurance rates are miss-representing flood risk and incentivizing the wrong actions.
- Need to be careful in incentivizing the wrong kind of behavior.
- Cost benefit ration study (like the USACOE) – what is the scale of the benefit? Who pays and how much? Where do responsibilities start and stop?
- Is project large enough for public funds?
- Indirect costs and benefits – loss of life, mental health issues, homelessness, (soft costs) etc. These are real costs that aren't accounted for in benefit-cost analysis.

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§ Discussion

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§ Consensus

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§ Actions

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Question #5 – What level of flood risk is acceptable? How frequent? How severe?

§ Positions

- Property damage (water in house) is like an assault, and has associated soft costs.
- FEMA – 100 yr
- Vertical vs Horizontal accounting of risk. Need more mapping.
- Communicating risk – everyone is in a floodplain. Floodplains don't stop at a line on the map.
- Not single answer, based on community-specific criteria.
- Similar to healthcare – fed level is minimum standard. Higher level is purchased by those with higher means.
- Tiered system with costs associated with each tier.
- Repetition (how often) of events should drive the decisions.
- Perform surveys of structures to identify structures at risk and help prioritize mitigation projects. This is being done in Rockford by IDNR-ISWS-FEMA as a pilot

§ Discussion

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§ Consensus

- Nuisance depends on perspective.

§ Actions

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Question #5b – Should nuisance flooding be reduced at tax payer expense?

§ Positions

- Covered in previous questions...

§ Discussion

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§ Consensus

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§ Actions

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Group Breakout Reports:

“Identify Group” report discussion:

Not making urban flooding mapping information available isn't fair to future buyers.

Mapping efforts at the state level would not be palatable to most communities, although some communities are doing it on their own (Downer's Grove is an example). How do you do it fairly and constantly...not possible? All urban areas are at some kind of risk.

Radon, asbestos, lead paint...why not flood risk as part of the regular disclosure? The Illinois real estate disclosure form does mention certain kinds of flood issues, like leakage and backup, but other kinds of basement flooding can be interpreted differently or unscrupulous reporting by owners.

"Reduce Group" report discussion:

Maintenance needs for green and grey infrastructure. Green infrastructure should be implemented as possible when redoing other infrastructure. Buyouts are a chance to help get rid of risk at the property and eliminate other risk in the community by implementing other stormwater measures, like detention basins, in the buy-out property (two for one benefit).

Municipalities being asked to take on more and more risk. Developers asked to take care of new risk, but that still leaves chronic flood problems that were already there before new development.

Local level not always the best level to govern because they may just push their problems on to other communities. Must work together with other municipalities so everyone's interest is accounted for.

Stormwater storage is important issue.

"Pay For Group" report discussion:

Larger communities with lots of staff have lots of funds and resources, smaller communities don't have the same opportunities. Social justice. How can communities work together (municipalities and counties, drainage districts, etc) through intergovernmental agreements to be more efficient and extend resources where they wouldn't otherwise be available. Agreements need to be signed, not oral.

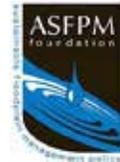
Nuisance flooding definition – widespread shallow standing water – who is responsible. Everything treated separately. Needs to be separated into segments of urban flooding types.

Model stormwater ordinance being prepared with ISWS-IDNR. Will be another tool for communities to use.

Revolving funds, continuously available revenue stream is important to move projects forward and make the kind of improvements that at needed to make significant progress.

Bills are being worked on at the Illinois state legislature (general assembly) to push forward with progress on flooding and stormwater issues. Urban Flood Awareness Act is the initial foot in the door. Need to define and show the benefit (in a business sense) to make the argument for funding and return-on-investment.

Grant dollars for pilot projects to demonstrate success that would lead to sustained funding for more projects. HUD and the Rockefeller Foundation grant money is being pursued.



Group Report-Out – IDENTIFY URBAN FLOOD RISK

Urban Flooding Definition

The Urban Flooding Awareness Act defines urban flooding as “the inundation of property in a built environment, particularly in more densely populated areas, caused by rainfall overwhelming the capacity of drainage systems, such as storm sewers. ‘Urban flooding’ does not include flooding in undeveloped or agricultural areas. ‘Urban flooding’ includes (i) situations in which stormwater enters buildings through windows, doors, or other openings, (ii) water backup through sewer pipes, showers, toilets, sinks, and floor drains, (iii) seepage through walls and floors, and (iv) the accumulation of water on property or public rights-of-way.”

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Mitigation of these impacts requires an understanding of the root causes. These may include:

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- Basements located in saturated, poorly drained soils are likely to experience seepage.

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- Overbank flooding is a natural process that occurs when rivers, streams, and lakes flow outside of their banks. In an urban setting, this natural process can be exacerbated by development pressures, leading to frequent and chronic flooding.

Impervious surfaces

- As more land is converted to urban and suburban areas, the amount of surface area available for water infiltration into the soils decreases.

Inadequate site drainage

- In an urban setting, overland water paths may not be provided or can be obstructed by development, causing localized drainage problems that lead to flooding.

Climate uncertainty

- Increasing frequency and intensity of weather events are placing more pressure on urban drainage systems.

Topic Title – How to Identify Urban Flood Risk

Group Facilitator – Matt Koch

Group Speaker – Paul Osman

Group Scribe – Brad Winters

In the context of the above, what is your opinion on the following?

HOW TO IDENTIFY URBAN FLOOD RISK

- Q1 – Do you agree with the definition of urban flooding presented in the UFAA legislation?
- Q2 – What level of flood risk is acceptable? How frequent? How severe?
- Q3 – Should urban flood risk areas be mapped? What are the ramifications of such mapping?
- Q3b – What are some common means to document the local extent of urban flood risk? (for communities and planning purposes)
- Q3c – What technologies are useful for identifying urban flood risk?
- Q4 – Should urban flood risk areas be regulated (no basements, minimum floor elevations)?
- Q5 – Is there a meaningful correlation between urban flood problems and mapped soil types?
- Q6 – Older areas versus newer areas – are recently developed areas flooding?
- Q7 – How do we assess damages/costs from urban flooding (wet basements versus flooded septic systems or ruined landscaping)?

Question #1 – Do you agree with the definition of urban flooding presented in the UFAA legislation?

§ Positions

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§ Discussion

- Make sure that the definition talks about precipitation not just rain.
- The definition of urban is loose; could it be tied to population density?
- What really is the definition of urban? The census and MS4 have definitions of urban, but they are restrictive and would get rid of quite a few locations that experience what looks like urban flooding just because of the population.
- The approach to the study is wrong. Seepage is a maintenance issue for the homeowner only and should not be included. Sewer backup can be independent of rainfall and is not flooding. Streets are sometimes used as a flood management tool and therefore not something that needs to be fixed. Flooding is determined in this type of definition by type of flooding, i.e. these 15 structures have this type of flooding. Also if there is a group of houses that have a flooding problem they should pay for the fix, not everyone else.
- The primary objective of the Tinley Park's Stormwater Management Program (SMP) is to promote the health, safety and general welfare of the present and future residents of the Village of Tinley Park and downstream drainage areas. More specifically, the goals of the SMP are as follows:
 1. Prevent flood damage by preserving the natural rivers and streams; as well as providing and maintaining proper conveyance and detention systems;
 2. Maintain the normal hydrologic balance of streams, floodplains, ponds, lakes, wetlands, and groundwater by storing and providing for infiltration of wet-period runoff in floodplains and wetlands, and utilize detention facilities to attenuate the peak of stormwater runoff created by increased impervious areas;

3. Improve water quality by filtering and storing sediments and attached pollutants, nutrients, and organic compounds before they drain into streams or wetlands; and
 4. Maintain and enhance the aesthetic qualities of developing areas.
- Tinley Park uses a functional definition of flooding that lists a hierarchy of flooding types to determine the service level.
 1. Causes Property Damage: Documented stormwater damage caused to the primary structure by riverine or shallow flooding. Damage caused by mechanical failures or power outages are not considered.
 2. Public Safety: The ability of emergency vehicles and personnel to respond during a storm event.
 3. Impacts Property Value: Mandatory flood insurance, standing water following a storm event and use of roadside ditches rather than enclosed storm sewers may negatively affect property values in the area.
 4. Negatively Affects Quality of Life: Standing water and excessive roadway flooding (more than one foot at the crown of the road) can limit the use of the property and affect the psychological comfort of the residents.
 5. Maintenance Problems: Any portion of the stormwater conveyance or storage system requiring excessive maintenance by Village staff.
 6. Water Quality: The Clean Water Act requires various steps be taken to improve water quality. Water quality monitoring as well as various system improvements are required as a result.
 7. Non-compliant Standards: Many developments were constructed in accordance with design standards that are obsolete.
 - Other communities have a hierarchy type definition but maybe in a different order.
 - FEMA definition lists flooding beyond the one square mile limit.
 - We need to get everyone to determine that they all live in a floodplain we are just in a different risk level and some have a mandatory insurance purchase.
 - Property damage is a key component of flooding and it is excluded now.
 - Responsibility for the flooding should be tied to the definition.
 - What makes the definition of this flooding specific to urban flooding and why?
 - Is urban part of the cause or is it just a bigger problem?
 - If the definition is too broad it will become unmanageable.
 - You could list what is not flooding. Seepage and sewer backup for example are not flooding.
 - A simpler definition might be better. Like non-ravine flooding?
 - You have to talk about whether or not it is public or privately owned and how it is funded for each is different.
 - We need to make sure that public and private properties are all required to pitch in and fix the issue.
 - In a drought seepage will happen because of soil drying out and pulling away from the foundation. Flooding could also occur during the winter when the soil is frozen.
 - Manmade causes might be a way to narrow down the definition.
 - We should include more areas in the urban definition to include more people.
 - Basement flooding is a bottomless pit that we can't solve.
 - Maybe it is a definition of water problems not urban flooding.
 - A water problem mitigation report might be a good outcome for people to figure out how to fix some of their own problems.

§ Consensus

- We need more refinement of the definition.
- Make sure the report breaks out who is responsible for the different causes of flooding.
- Reduce the risk of flooding, but we cannot solve the problem.

§ Actions

- Report writing group should address this definition.

Question #2 – What level of flood risk is acceptable? How frequent? How severe?

§ Positions

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§ Discussion

- The definition of flooding should be tied to damages, so if streets are designed to be the overland flow path that is not flooding and it is acceptable.
- Road flooding should be shallow enough that emergency services can transverse the street.
- Some issues are access and transportation.
- Emergency services and critical facilities should be available.
- The level of service for areas is important
- Flood damaging structures is a problem.
- Government programs should not cover landscaping damage.
- Level of acceptance of flooding is different for different people.
- How do we prioritize the flooding types? We should do this prioritization.
- We should prioritize the flooding in first floor over the basement flooding.
- One complication is that some people rent out basement apartments in bigger cities and they will lose everything if they get basement flooding.
- Basement flooding is also a problem if all of the services come through the basement that technically makes the whole house unlivable.
- We need to not lose sight of industrial or commercial as well.
- We could use FEMA standards to determine what damage is and quantifying much damage.
- We could also use a depth of flooding amount to determine eligibility for programs. Maybe the frequency could be built in a sort of cumulative damage function.
- There is no renters insurance that will cover basements or basement apartments. Some people are getting their basement backup policies cancelled because of high frequency. But they will get federal individual assistance, but only if there is a federal disaster.
- We could use the severity of floods to classify floods instead of 1% event.
- Many different ways to define the problem and no way to give a frequency event type for this type of flooding. We should just reduce the exposure to damage.
- There are catastrophe risk models out there (AIR & RMS insurance modeling companies do this)
- Should there be a statewide building code? Many do not like this.

§ Consensus

- We should prioritize flooding types.

§ Actions

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Question #3 – Should urban flood risk areas be mapped? What are the ramifications of such mapping?

§ Positions

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§ Discussion

- No one wants to be mapped, because it stigmatizes properties.
- Everyone is at risk, because it is a constantly changing based on the local environment, i.e. downspouts change, landscaping changes.
- Must have the disaster assistance information to make the mapping correct.
- Map the HGL of the storm sewers to determine the amount of head differential between the storm sewers and the basement openings.
- Basement flooding is also related to whether the power is on or off to power sump pumps.
- The realtors don't want mapping.
- Some communities have decided to map it, but it will be difficult to make it work on a larger level.

- Maps could never be kept up with at a reasonable rate. It would be more problematic than keeping up with the FEMA floodplain maps.
- People would never know if they are relying on old maps.
- You can't generalize an area for a specific house problem.
- Experts would have to look at each structure to determine whether it should be mapped.
- The maps would only be used to determine where you would buy a house not to determine if you have a house that floods.
- Real estate disclosure act is the way to show the flooding for houses you purchase.
- You would devalue homes by mapping.
- There would probably not be funding, it would end up being an unfunded mandate.
- You need to have maps that determine the risk better.
- People who bought houses in 1950 didn't pay for infrastructure that protects them from the 1% chance now. People who buy new houses after regulations went in did pay for the infrastructure. Those in new houses shouldn't have to pay for those who didn't pay for the infrastructure in the first place.
- The neighborhood tax (special service tax) would be the way to get upgraded infrastructure in specific areas.
- New building codes should take the flooding problems into account.
- You would have to map everyone in the risk zone because everyone is at risk. Otherwise it is structure by structure and that wouldn't be feasible.
- Downers Grove does have flood maps for local depression flooding areas.

§ Consensus

- Not feasible to specifically map structures.

§ Actions

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Question #3b – What are some common means to document the local extent of urban flood risk? (for communities and planning purposes)

§ Positions

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§ Discussion

- Local mapping is one way
- HGL map
- Most cities are keeping information about which properties flood outside of the floodplain. Some will give this information out; some keep it just for planning purposes and do not give it out.
- There is a flooding declaration form that you have to fill out when you sell a house. The recourse is to sue the seller if they lied on the form.
- Is the local government liable if they say there isn't a problem and then there is when someone buys the house?
- Property values will be affected if you start telling who had water in their basement.
- After a big rain you can tell about who gets flooding by who has garbage out front.
- Ottawa developed a map for flooding after a record event. They are doing a disconnection grandfathering for disconnection of sump pumps to sewers.
- Mosquito abatement districts have maps of standing water areas.
- Cities don't want the legislature to send through an unfunded mandate for them to go and fix the issue.

§ Consensus

- If there is mapping to be done it should be at a local level, but not an unfunded mandate.

§ Actions

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Question #3c – What technologies are useful for identifying urban flood risk?

§ Positions

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§ Discussion

- Mapping
- Sewer mapping updates would be helpful to tell where flooding is.
- Sewer modeling is difficult and expensive and most locals don't have the software to do the modeling.
- Phone calls and complaint lines are a way to identify risk.
- Mobile app that will document flooding and geo-reference photographs.
- Stream gages and high water marks – hwm are perishable
- Historical local knowledge
- Claim data – privacy issues
- Soil type mapping (NRCS) – must be updating.
- GIS data to determine the amount of impervious.
- Inspections to determine if the system is functioning as designed.
- All of these are indicators of urban flooding.
- We could produce a risk map that shows the different indicators for urban flooding. Heat map would show level of risk.
- Once you start mapping it is obsolete.
- This mapping could be a planning tool for determining action.
- FEMA does some risk mapping, Area of Mitigation Interest (AOMI)
- Who should be in charge of doing these programs?
- Should this mapping just be used as a planning tool? Regular people won't know how to use the map and won't be happy if it shows they are now in a higher risk area.
- Is there a way to help encourage communities to do this because some communities do not have the money or gumption to work on this problem?
- Maybe the report should tell the cities better ways to determine their own risk factors if they are interested. We don't necessarily have to mandate change, especially if many locals are already doing some of these.

§ Consensus

- A map showing different risk type zones would be better than calling out specific houses, everyone's structure would be in some risk zone. It should not be mandated, but a suggestion from experts.
- The report should be a guidance document.

§ Actions

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Question #4 – Should urban flood risk areas be regulated (no basements, minimum floor elevations)?

§ Positions

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§ Discussion

- Assuming you could identify the areas, regulations are not palatable.
- The existing structures would have to be grandfathered.
- Incentivize the overhead sewer program. Many communities do this now.
- Require overhead sewers for new construction or substantial improvements.
- Overhead sewer is required for new construction in Addison from 1970, Tinley Park from 1968, Ottawa also does this.
- Too hard to identify urban flood areas.
- Need community wide regulation, not just risk areas.
- There is no statewide building code.
- State plumbing code could be modified to require overhead sewers.
- Local resistance to state regulation.

§ Consensus

- We should consider regulations, but it would have to be at a local level because it is too hard to determine which areas should be regulated. Community wide regulation is the way to go.
- Overhead sewers are the way to go for sewer backup flooding.

§ Actions

- See if Tinley Park has a correlation between overhead sewer requirements and lack of basement backup claims.

Question #5 – Is there a meaningful correlation between urban flood problems and mapped soil types?

§ Positions

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§ Discussion

- Yes it contributes to flooding.
- The soil type doesn't matter when the ground is frozen.
- Also should include ground cover (pervious/impervious) as well.
- The more impervious area you have the less the soil types matter.
- Infiltration is also limited on clay soil types as well as impervious areas.
- How to best should we use the soils data to reduce urban flooding?
- The NRCS soil maps show shrink swell not necessarily saturation.
- Green infrastructure has limitations on soil types it can be used on.
- Building codes might be a good place to use soil types.

§ Consensus

- Yes soil types contribute to flooding, but so does ground cover (pervious/impervious).

§ Actions

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Question #6 – Older areas versus newer areas – are recently developed areas flooding?

§ Positions

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§ Discussion

- The older sections (pre-stormwater detention regulation) generally have more flooding. The storm sewers have at or less than a 2 year capacity. Most new storm sewers are designed for 10 year.
- Functional definition is working well for Tinley Park. Does water get into my house? Is there a solution? Will I pay for it?
- Older areas sometimes complain that newer development is causing more flooding to them.
- Demographics: are poorer people more affected?
- It is not the age of the neighborhood that makes the difference, but the age of the infrastructure. If an area is redeveloped and the infrastructure is upgraded, then they don't have as much flooding as an area that has not been redeveloped.
- The places in Chicago that have longer sewer lengths are more impacted.
- It is not just poor neighborhoods that are flooding. They also have aging infrastructure and are sometimes out of the incentive bracket for funding.
- Out of sight out of mind...for sewer systems. They need maintenance and upgrades also.

§ Consensus

- Older areas are flooding more because of greater intensity rainfall, greater upstream and downstream development and greater % impervious, maintenance issues.

§ Actions

Question #7 – How do we assess damages/costs from urban flooding (wet basements versus flooded septic systems or ruined landscaping)?

§ Positions

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§ Discussion

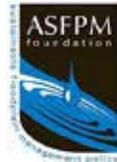
- Actuarially.
- Prioritize the level of damage – develop a schedule what is more important.
- Apartment buildings are a business and those businesses don't get disaster assistance so individuals living in an apartment that gets flooded will have to go out and find another place to live.
- Legislative perspective – what are the legislators interested in?
 1. They want a high B/C ratio for projects.
 2. Higher income areas get more notice.
 3. Rural legislators prioritize farm ground over structures. You can rebuild houses, but lost farm wages are lost.
 4. The economic development impacts are important. Bringing in businesses are very important.
 5. You will see a difference between upstate and downstate regulators in how much they see urban flooding as a Chicago problem.
 6. Constituent impacts? It is subjective to each legislator.
 7. They are not likely to give a statewide mandate but probably would do authorizing legislation.
- Depth damage curves from the Corps are one way to assess damages.
- IEMA does this assessment for disaster declarations.
- Funding is hard to come by. Unless you are a homerule community you can't develop your own funding unless you go to the legislature.

§ Consensus

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§ Actions

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Group Report-Out – REDUCE URBAN FLOOD RISK

Urban Flooding Definition

The Urban Flooding Awareness Act defines urban flooding as “the inundation of property in a built environment, particularly in more densely populated areas, caused by rainfall overwhelming the capacity of drainage systems, such as storm sewers. ‘Urban flooding’ does not include flooding in undeveloped or agricultural areas. ‘Urban flooding’ includes (i) situations in which stormwater enters buildings through windows, doors, or other openings, (ii) water backup through sewer pipes, showers, toilets, sinks, and floor drains, (iii) seepage through walls and floors, and (iv) the accumulation of water on property or public rights-of-way.”

Urban flooding is characterized by its repetitive, costly and systemic impacts on communities, regardless of whether or not these communities are located within formally designated floodplains or near any body of water. In an urban environment, any of the issues described below can independently or in combination cause urban flooding, impacting vital infrastructure with increasing consequences in more densely populated areas.

Mitigation of these impacts requires an understanding of the root causes. These may include:

High groundwater/ saturated soils

- Basements located in saturated, poorly drained soils are likely to experience seepage.

Aging and Inadequate Storm Sewers

- *Combined sewer capacity exceeded:* Older areas of communities may have combined sanitary and storm sewers, which can be overwhelmed during precipitation events.
- *Storm sewer capacity is exceeded:* Storm sewers are designed to convey specified precipitation events that, if exceeded, will result in water ponding in streets, yards, public right of ways and potentially entering structures through lowest openings.
- *Storm sewers that cannot drain due to flooded open channel receptors:* During major precipitation events impacting a larger geographic area, receiving rivers and streams may rise to a depth which prevents the discharge from storm sewer outlets, even to the extent of backflow through the sewer system.

Out of bank flow from rivers, streams, and lakes

- Overbank flooding is a natural process that occurs when rivers, streams, and lakes flow outside of their banks. In an urban setting, this natural process can be exacerbated by development pressures, leading to frequent and chronic flooding.

Impervious surfaces

- As more land is converted to urban and suburban areas, the amount of surface area available for water infiltration into the soils decreases.

Inadequate site drainage

- In an urban setting, overland water paths may not be provided or can be obstructed by development, causing localized drainage problems that lead to flooding.

Climate uncertainty

- Increasing frequency and intensity of weather events are placing more pressure on urban drainage systems.

In the context of the above, what is your opinion on the following?

HOW TO REDUCE URBAN FLOOD RISK

- Q1 – What factors determine the appropriate level of government for managing stormwater? (ordinance, utility fees) (what are the pros, cons of countywide stormwater management?)
- Q2 – Are the current stormwater design criteria still sufficient? What should change?
- Q2b – Should urban stormwater systems be able to convey and or store a 1% chance storm event?
- Q3 – What is the role of green infrastructure measures in conventional flood control projects?
- Q3b – What is the long term effectiveness of green infrastructure and stormwater BMP measures in flood reduction?
- Q4 – What measures have proven successful? What measures have not worked?
- Q5 – Should urban flood risk areas be regulated (no basements, minimum floor elevations)?
- Q6 – What level of flood risk is acceptable? How frequent? How severe?
- Q6b – Do we trade basement flooding for greater overland and street flooding?

Question #1 – What factors determine the appropriate level of government for managing stormwater? (ordinance, utility fees) (what are the pros, cons of countywide stormwater management?)

§ Positions

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§ Discussion

- State of IL does not have a State Building Code
- Counties have stormwater ordinances
- Downstate opposes state-wide regulations. Those communities do not require coordination with other communities as much.
- There is a statewide commercial building code and electrical code.
- Zoning is local. Most units of local government do not want to give that up. More significant problems, when they overwhelm the local government, the issue needs to be addressed by county or state governments
- Localized drainage problems – handle locally. Regulations should be based on the watershed/trib area.
- When local units of government handle stormwater there are inconsistencies. Can create a minimum standard at the county level and communities can choose to regulate at a higher level. There is a need for education of why the regulations are in place and then re-educate.
- Some communities do not have the capacity to enforce regulations. Small staff in small local government rely on larger government to help.
- In Cook County MWRD has been most responsible for stormwater management, but are not seen as a regulatory agency.
- Challenge to create consistent standards.
- Milwaukee gathered communities for input on the needs
- MWRD has authority to regulate stormwaters in Cook County. Tried to put in a similar ordinance as Lake County and McHenry County. They now have an ordinance. It has been accepted by the local governments.

- Central part of Illinois. Many of the communities are centered around waterbodies. Some coordination is still required with surrounding communities. Watershed regulations would be beneficial.
- Niles passed a stormwater ordinance in 2009. They had Village Board members deciding whether one business could flood a neighboring property. They were excited about the WMO, to improve enforcement.
- Urban flooding and riverine flooding are very different. Regulating how to resolve existing flooding, should be done at the local level.
- At the State level, the regulations are intended to be a minimum for the entire state. State provides the basic minimum requirements, local governments can regulate to a higher level, if they desire.
- Ordinances are mostly written for new development. Urban flooding is occurring in existing development. State or county governments should not regulate the solution to urban flooding.
- Stormwater regulations regulate new impervious areas, urban flooding falls through the cracks.
- FEMA only maps areas with a drainage area more than a square mile. Urban flooding can occur in both the floodplain and outside the floodplain.
- Every property in Illinois that has a basement has a risk of flooding. Even small towns in downstate Illinois can have urban flooding.
- Municipalities are in charge of urban flooding. The framework is there, but may need to be augmented. The current framework has funding needs and technical needs.
- We need to define the role of municipal government.
- Funding is a challenge. Those with the greatest need have the least amount of money.
- The structure that we currently have is not working. Many communities are not capable of addressing the problem. They have other concerns, other than flooding.
- Detention is not required to fix flood damage.
- Urban flooding is a profound problem in Cook County. FEMA is putting in between \$3-4 Million in Cook and DuPage Counties. Urban flooding is not being accepted.
- Local communities understand the problem better, but do not have the expertise to solve it. Give the county the authority to solve problems identified by local governments.
- Cook County has regional and local authority. Communities without staff do not have shovel-ready projects, but MWRD is providing technical expertise to them.
- No one is addressing urban flooding in the inner ring of communities surrounding Chicago

§ Consensus

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§ Actions

- At the local level, the problem needs to be identified. Provide regional expertise to solve the problems.
- Focus on assistance without slap on wrist.

Question #2 – Are the current stormwater design criteria still sufficient? What should change?

§ Positions

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§ Discussion

- There is good design criteria for NE Illinois (volume, water quality, design storms). The bigger question is what does it apply to (redevelopment, infill, and new development).
- Design is based on old rainfall data (Bulletin 70). TP 40 came from a time that was very dry in Illinois. NOAA has a newer study of rainfall data through 2004. O'Hare continues to reset records for rainfall, which is seen across the board.
- Current stormwater design criteria is being used to fix problems from old standards

- Could use freeboard to address climate change.
- MWRD is creative with sub-watershed release rates for the Little Calumet Watershed.
- Design criteria has been a tradeoff of how much damage can we accept and how much can we invest in the problem. Our criteria should be based on risk.
- Citizens do not understand the design of the system. Storm sewers are only designed for small storm events and there should be stormwater in the streets. Citizens should be involved in setting the design criteria.
- Communities know where the flooding is taking place. Local government may want to use different design criteria in flooding areas.
- There is a difference between sewer-shed and watershed.
- Single lot development needs to be regulated.
- Do we go after symptom or cause. We need to hold water where it falls.
- Green infrastructure has been oversold in some areas. A balance is needed of grey and green infrastructure.
- Design criteria focuses on new development, which does not apply to redevelopment.
- Green infrastructure can be designed to reduce basement seepage, if designed properly.
- Milwaukee uses sewer-sheds. Those with flooding are typically flooding themselves (leaky laterals, downspouts away from house). There is a sliding scale based on income and property owners. Property owner is responsible for solving their urban flooding on private property
- Good data is needed to understand the problem to inform the design criteria.
- Design criteria needs to remain local. Public needs to understand risk vs. reward.
- Some communities have detailed contours. Should require 1-foot contours and identify depressional storage areas.
- Design criteria needs to address maintenance.
- Regulations need to work together between agencies.

§ Consensus

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§ Actions

- Need better data
- Need to provide different design standards for new and re-development
- Green infrastructure should be included in design criteria
- Focus on criteria for single-lot development, which will require education of residents.
- Maintenance of facilities should be included
- Understand the performance of existing facilities
- Criteria should be based on risk

Question #2b – Should urban stormwater systems be able to convey and or store a 1% chance storm event?

§ Positions

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§ Discussion

- New development should be required to manage the 100-yr event. Fixing existing problems there is a high cost to retrofit an existing development
- Use number of basement flooding events rather than 100-yr storm
- The more rare the event, the more uncertainty about the rainfall.
- Redevelopment, green infrastructure is much more important.
- In urban areas we are very far from the design storm. The City of Chicago can only provide protection for the 5-yr event. Define what the systems can handle.
- Existing systems were not designed to handle the 100-yr storm
- Typically design for the 100-year event, and then scale back for funding or risk factors.

- Green alleys are not designed for the 100-yr event, which is not practical. Instead they look at the release rate rather than the design storm.
- Need to find a way to communicate risk to homeowners – the system can handle 2-inches of rain, for example.

§ Consensus

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§ Actions

- We need to change the risk from a percent to inches of rainfall to communicate with the public
- New development and redevelopment needs to have different standards. New development 100-yr storm. Redevelopment, reduce the volume of runoff or risk of flooding.
- Need to understand the current capacity
- Funding – what is the cost vs. benefit
- Urban flooding should be addressed at a watershed management

Question #3 – What is the role of green infrastructure measures in conventional flood control projects?

§ Positions

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§ Discussion

- Green infrastructure is a piece of the puzzle. It has been oversold to some communities. Green infrastructure needs grey infrastructure.
- Green infrastructure is more important in urban areas than grey. It allows you to decrease the contribution of stormwater into the existing system. It should always be evaluated as part of the solution. When looked at as widgets that are applied, it not as successful.
- GI can be considered for distributed stormwater management. Need to think about GI differently than as a flood control model. It is a method to keep stormwater out of the system. GI can be used to provide storage up to 100-yr storm and improve protection downstream.
- Soils are very important component to providing runoff reduction as a result of GI.
- There is a big storage component to GI.
- It's much easier to reduce impervious areas rather than trying to keep soils from clogging in GI
- There is a lack of data for GI. Quantifying benefits is important
- CRS is working GI into credit system. In many cases, GI is treated as landscape. They have to be properly sized.
- There is a scale issue. With small percentages of participation, GI can be oversold
- City of Chicago is using HUD dollars to rebuild sewers. There is very little flood reduction. Flood reduction projects can take a long time and cost a lot of money
- There are some areas where GI should not be used, pollutants could be infiltrated along with the stormwater.

§ Consensus

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§ Actions

- Need performance-based criteria
- Maintenance requirements are needed
- There is a role for GI that needs to be integrated into flood control improvements
- GI should be used for new development and redevelopment
- Imperviousness should be considered in GI toolbox
- Scale. Need enough people participating to make a difference.

Question #3b – What is the long-term effectiveness of green infrastructure and stormwater BMP measures in flood reduction?

§ Positions

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§ Discussion

- Lake and McHenry County ordinances are focused on development. Maintenance falls on home owners/HOAs/business owners.
- DuPage County uses a fee-in-lieu of stormwater management for single lot development. This allows the county to provide regional detention
- City of Urbana. One provision in the ordinance creates a special taxing district if a HOA goes away. This allows the City to maintain.
- Some GI is “maintenance free.” Stormwater trees and some rain gardens are maintenance free while others require more maintenance. Reed canary grass works well to absorb water.
- On problem is easements. Many properties are not interested in providing an easement to the sewer district. Rain gardens are constructed within an easement.
- Do not try to hydraulically overload the system
- We need to expect to maintain GI just like we have to maintain pipes and catch basins. There are already agreements with private property owners to maintain infrastructure. GI can be maintained using the same systems.
- IEPA has funded much of the GI. Is there enough data on that GI?

§ Consensus

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§ Actions

- We need the data to determine effectiveness.
- We need to define who is going to maintain and responsibility
- Establish fee or tax for future maintenance
- Getting easements are needed (tax liability for the property)

Question #4 – What measures have proven successful? What measures have not worked?

§ Positions

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§ Discussion

- Undeveloped areas. Found hydric soils and wetlands and bought those properties. Strategic property acquisitions and preventing development in certain areas.
- Buyouts can be the only solution in some situation. In these cases, there is no other solution. Could use GI in those areas. Purchase properties in areas with historical river systems.
- In order to proscribe protective measures, you need to understand the problem. Provide inspections of the property to understand the problem. Then desktop analysis can be used for neighborhood issues.
- Re-grade back yards, extend downspouts.
- Homeowners are responsible to understand what is happening on their property. Cost share programs for backflow prevention, window wells, etc. Establish a program where someone teaches a new homeowner about stormwater on the lot. FEMA should loosen buyout restrictions, so communities are able to buyout more properties. FEMA provided funding to replace appliances, but did not solve the problem.
- Niles passed \$0.25 sales tax to fund stormwater program. Education was an important program.
- \$1 of mitigation saves \$4 of flood recovery. FEMA provides funding after the event, which is too late. Per-disaster mitigation \$\$ would go much further.

§ Consensus

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§ Actions

- GI can be used successfully
- Buyouts need to be considered

- Grey infrastructure such as relief sewers and detention have been very successful
- Education is key for homeowners
- Limit development in certain areas
- Pre-disaster mitigation \$ can go further than post-disaster
- Application of these methods needs to be looked at holistically

Question #5 – Should urban flood risk areas be regulated (no basements, minimum floor elevations)?

§ Positions

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§ Discussion

- Individual houses vary so much.
- Downers Gove have mapped urban flooding and regulate those areas.
- Elevation of the floor drain vs. the elevation of the sewer in the street
- Educating public officials is important when regulating isolated flood risk
- Homeowners do not want the stigma of flooding.
- Any urban area with basements is subject to flooding
- Wheaton uses TB 10-1 for basements
- Politically it is challenging to map urban flood risk
- Everyone is at risk. Educate everyone about their risk.
- Selectively enforcing regulations can result in flooding.
- When you do a home inspection, potential flooding should be identified.

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§ Consensus

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§ Actions

- Yes, urban flood risk should be regulated. However, it is difficult politically and could affect property values
- Public education is key.
- Integrate flood risk and damage potential into home inspections

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Question #6 – What level of flood risk is acceptable? How frequent? How severe?

§ Positions

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§ Discussion

- Flood risk needs to be communicated. Education is key
- New development should be held to a higher standard than existing urban areas
- Flood risk varies depending on audience (public, elected officials, technical).
- People are more afraid of the flood insurance than the flooding.
- In the public meeting, no flood risk is acceptable. The level of acceptable flood risk depends on the money needed to cleanup afterwards.
- Funding determines acceptable flood risk.
- FEMA has flood insurance for properties outside the floodplain. If you have 2 flood events in 10-years, they cancel your policy
- There is a strong political side to reducing flood risk.
- In some respects, the solution can create other problems. Solving one person's flooding could cause flooding downstream.
- Need to understand the loss associated with flooding

§ Consensus

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§ Actions

- Assign risk differently for re-development and new development
- Reducing flood risk is tied to funding and potential damages
- Each community looks at acceptable flood risk differently

Question #6b – Do we trade basement flooding for greater overland and street flooding?

§ Positions

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§ Discussion

- Ponding in the streets is not a complete street. It doesn't allow for pedestrians and bicycles. GI can be used to store the stormwater.
- Homeowner would want the water in the street over in their basement. Need to educate the public.
- Damages are damages. Regardless of whether it is to a vehicle or basement
- First priority should be to protect people's homes.
- For basement backups, older homes the basement walls need to be flood-proofed (easy drainable and reinforced).
- Ponding around a house will eventually make its way into the basement.

§ Consensus

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§ Actions

- Risk vs. damage of basements
- GI can be used to reduce the risk of basement flooding
- GI should be strategic when replacing infrastructure
- Overland flooding should be considered (yards rather than basements)
- Elevating structures and flood-proofing basements
- Funding is critical to solving basement flooding