Edison School Project

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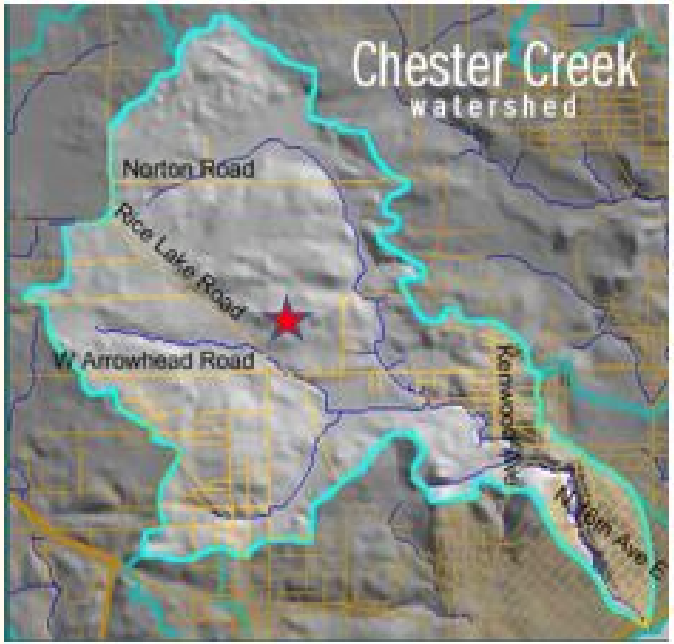
The Problem

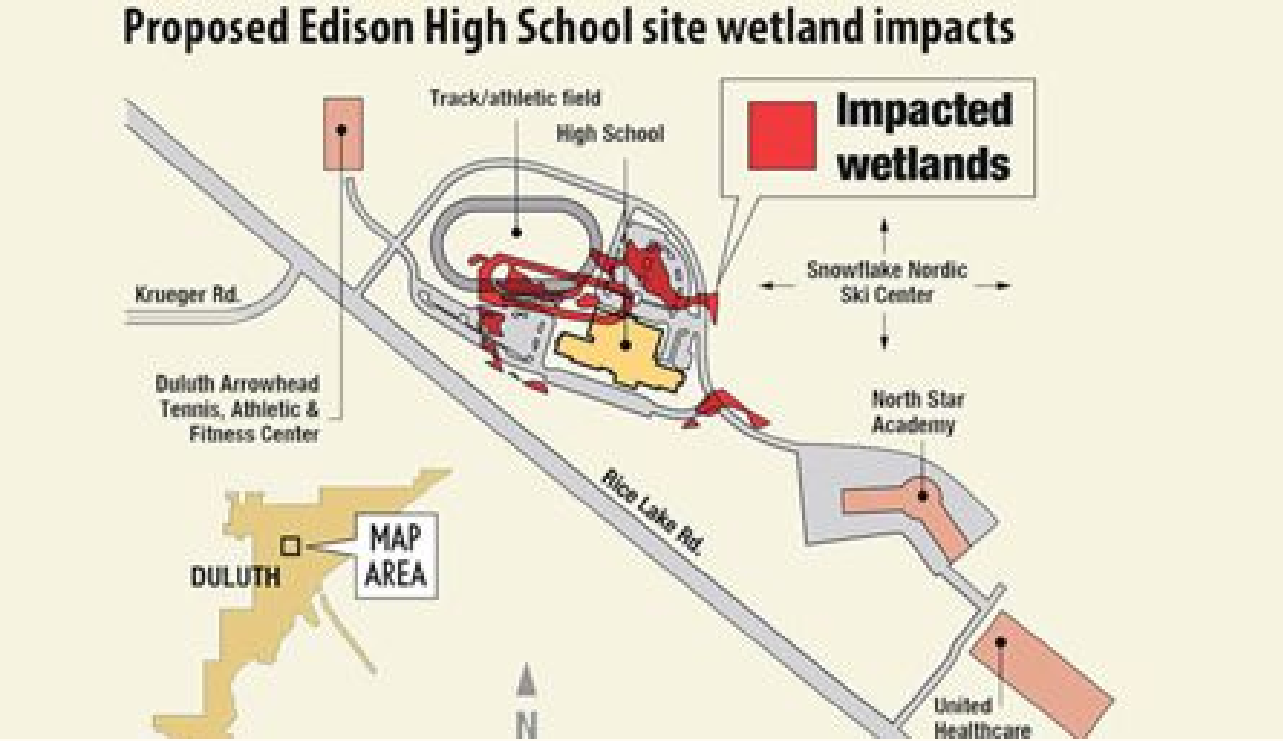
Edison high school near current K-8

Wetlands on proposed site

Couldn't find another site that fit their budget



The Original Plans



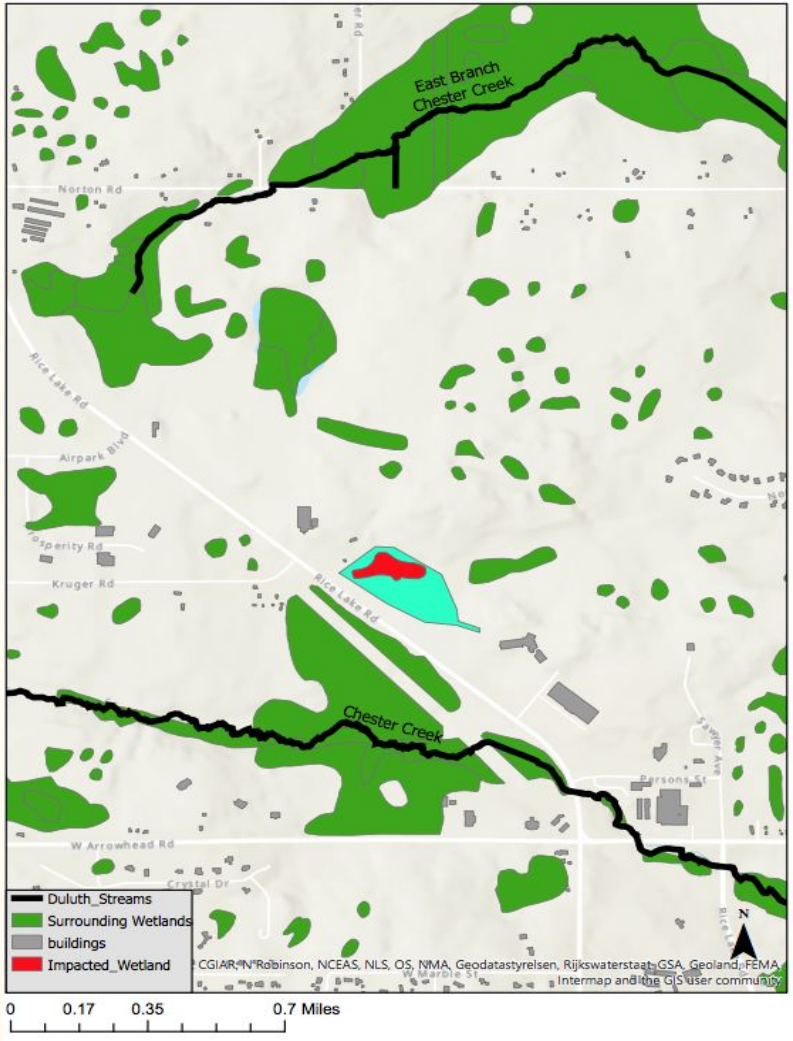
- Next to K-8 North Star Academy
- Build on Snowflake Nordic Ski Center
- 100,000 square foot building
  - 2 stories
- 300+ parking lots
- Track and Field area

The Original Attempts

- Building process shutdown by presence of “flood preventing” wetlands
  - Argued by city staff and commissioners
  - Citizen petition for environmental assessment
- Offers made on Duluth Central High School building denied
- Edison School will not be following through with their plans to build

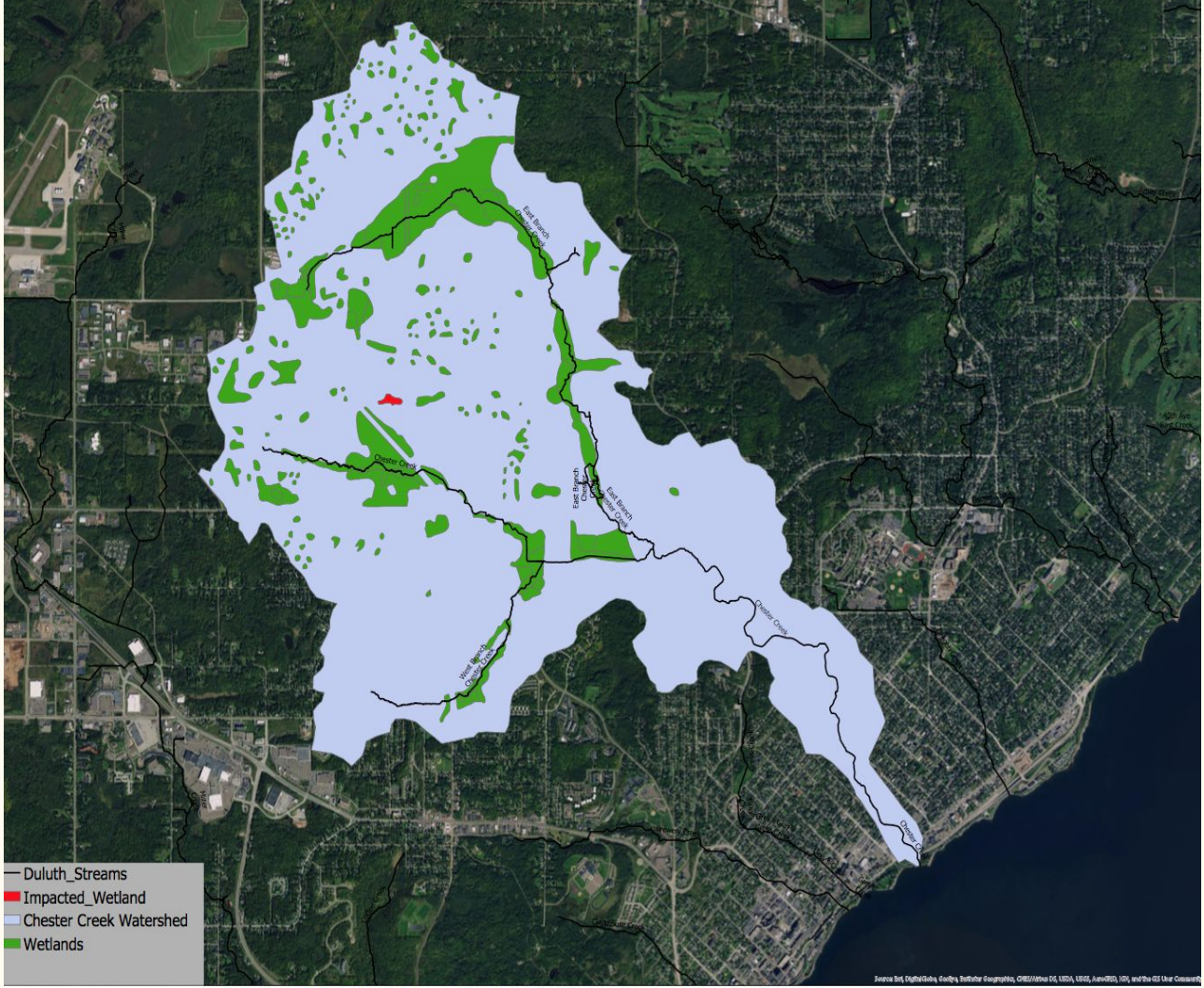
Surrounding wetlands

- Impacted Wetland ecompasses an area of 0.92 hectares
- Shrub based wetland (shallow)
- 2.2 million m^3
- Impacted wetland represents less than a percent of total chester creek wetlands



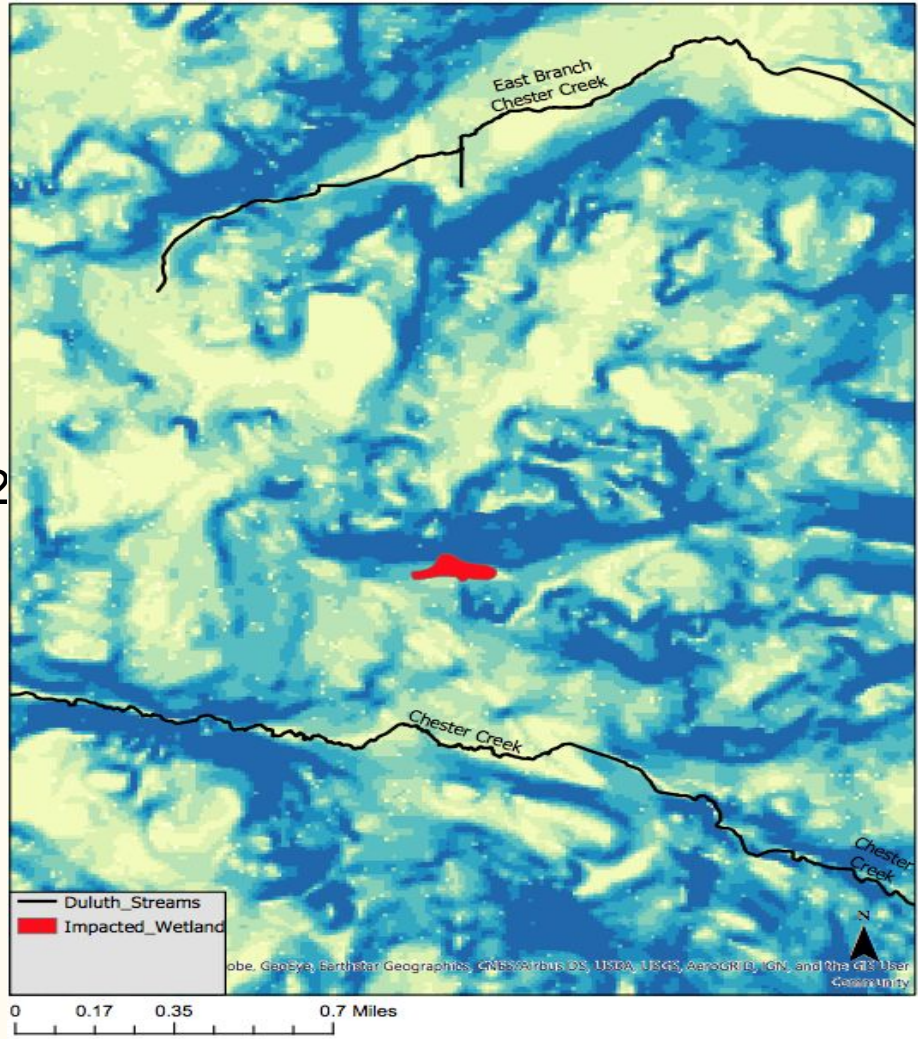
Headwater wetlands

- Any wetland located in proximity to the origin of a steam
- Most important for flood control



Slope

- Wetlands at steeper slopes are able to hold less water
- Charter school wetland located on a ~2 degree slope



Recommendations

- Purchase a building
- Build on Wetland Site
  - Build up from existing building
  - Two story plan could be made taller
  - Build parking ramp on existing parking lot
  - Mitigation Wetland
  - Flood Control Systems
  - Build track on different site

Purchasing an Older Building

- Purchase a Building
- Duluth Public Central High School
  - Sale price: $14 million
  - Repairs: $6-8 million
  - Four miles from North Star Academy
  - 77 Acres
  - Both offers were rejected
  - Didn’t want to sell to competition

Building a Parking Ramp

Build ramp on existing parking lot

Multiple entrances

$35-$65 per square foot

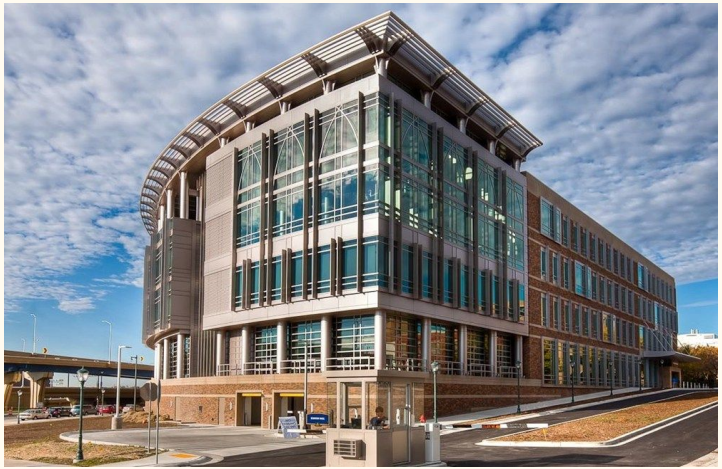
More than a new parking lot ($13)

Save money on flood storage and mitigation wetland

Cut down size of wetland by 5000 m2

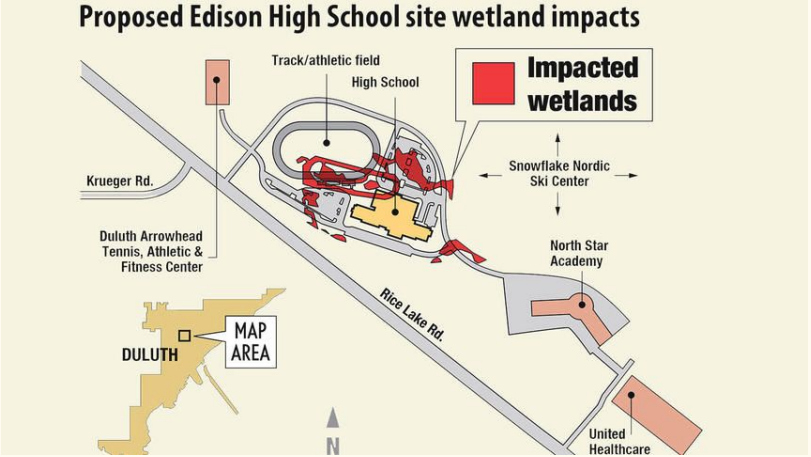
Building Up

- Costs likely similar to building on Wetland
- Build parking ramp
- Save amount of land altered in building process
- Tall buildings not aesthetically prefered
    - Architecture?



Building on the Wetlands

- Minimum of $20-25 million to build
- Require application from DNR or Regional Hydrologists
- Wetland Conservation Act
  - Mitigation Wetland required of “equal public value”
  - Does not have to be in same watershed (S St. Louis SWCD)
- Provide flood water storage
  - Wetlands
  - Underground water vaults
  - Underdrain structure
  - Parking lot structures



Creating a Mitigation Wetland

- Need to create same wetland in another area
- Same size and function as first wetland
- Close as possible
- Somewhere within the watershed ideally
- Flooded shrubland
- 9000 m2 needs to be restored
- 20,696 per acre
- About $45,000 dollars to rebuild wetland
- Could cut down area by building wetlands around complex

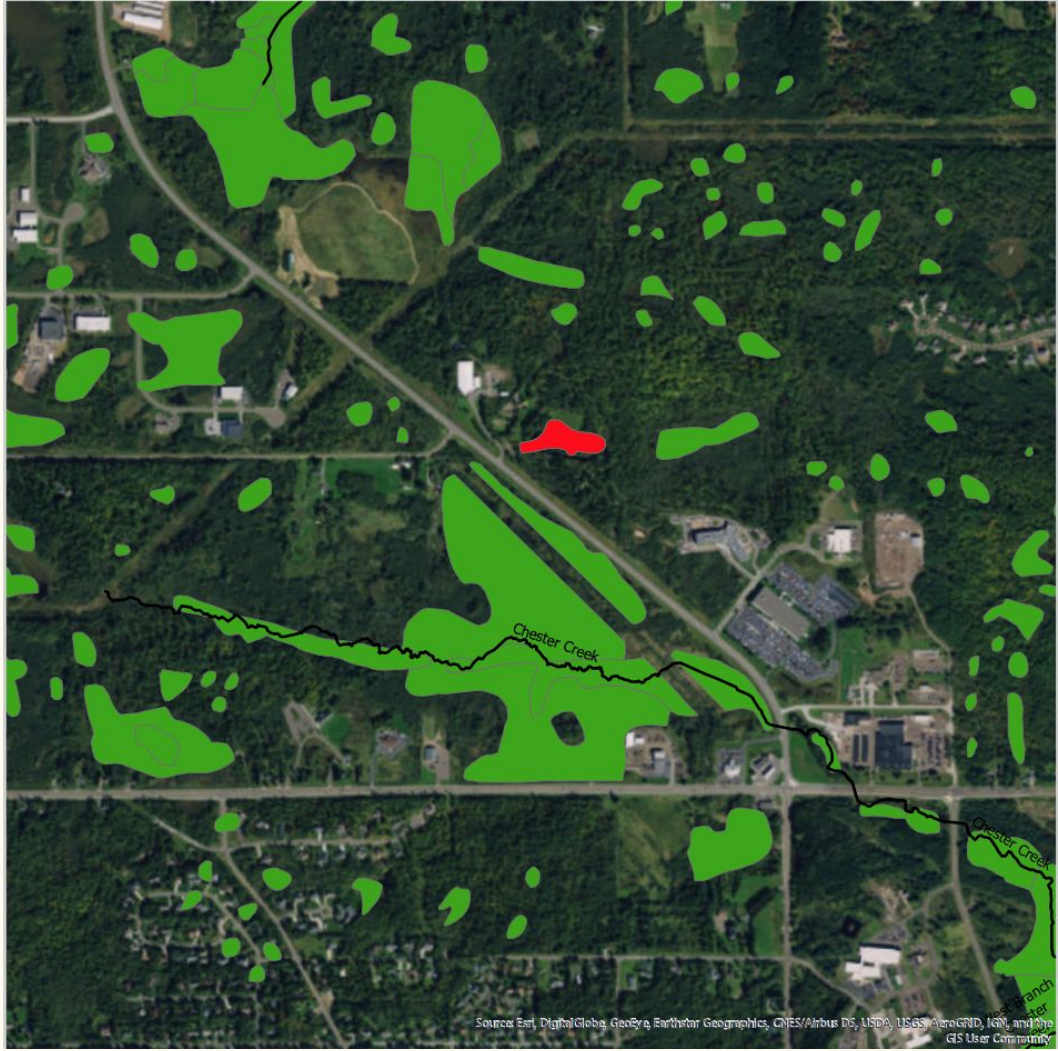
Building the Mitigation Wetland

- Excavation
  - Compacted soils change hydrology and competition on native plants
  - Low ground pressure equipment
  - Till compacted soils
- Sediment Control
  - Barriers upslope
- Plants
  - Seed plan for wetland that is destroyed
  - Prevent weeds and invasives
- Maintenance
  - No herbicides or pesticides
  - Annual revegetation report
  - 80% cover compared to disturbed wetland

Policy (Mitigation Wetland)

- Wetland Conservation Act
  - wetlands should not be drained or filled unless they are “replaced by restoring or creating wetland areas of at least equal public value under a replacement plan”
- Wetland Regulations of Minnesota
  - MN Board of Water and Soil Resources and MN DNR
  - 1:1 destroyed:mitigation wetland unless
    - Not complete in advance
    - Built in different area
    - Not same kind

Area's in Duluth (Mitigation Wetland)



Flood Control

Many methods

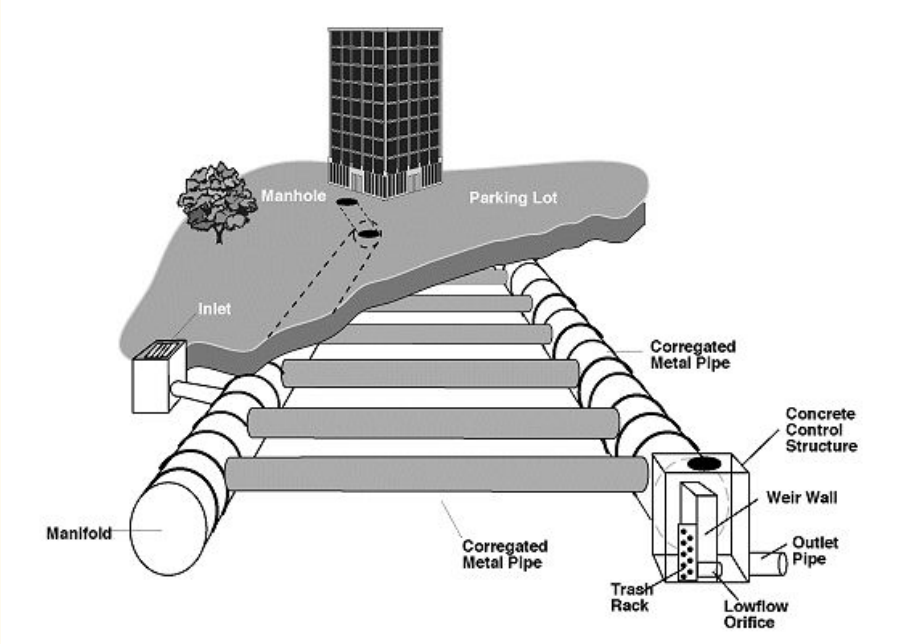
- Parking Lot Drains
- Water Vaults
- Underdrain Structure

Permeable Surfaces

- Permeable pavements
  - Parking lots (if applicable)
  - Sidewalks
  - Roads
- Infiltration trenches

Water Vaults

- Placed under parking structures
- Variable price
  - $10 per cubic foot
- Holds and stores water underground
- Slowly releases water as vault fills
- Decrease runoff



Underdrain Structure

- EPA program, SUSTAIN determine the management practices in urban watersheds
  - Schematic to determine areas hydrology
  - Use to determine best practice
- SUSTAIN: Underdrain Outflow
  - Water storage
  - Delayed outflow
  - Works best in areas of runoff

Figure 3-10. Processes considered in an underdrain structure.

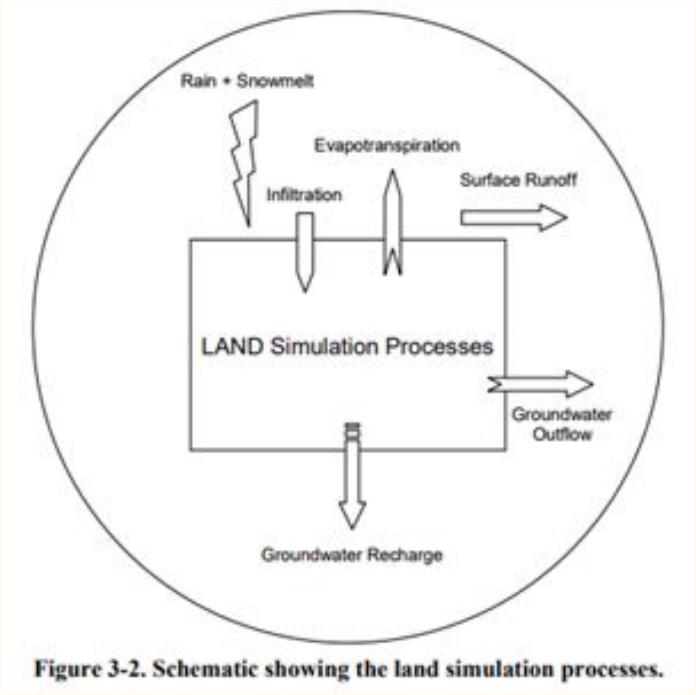


Figure 3-2. Schematic showing the land simulation processes.

Cost Comparison

- $26 million to build on wetland with modifications
- $23.5 million without parking ramp
  - $20-25 million to build school
  - $2.8 million more to build ramp compared to lot with same number of spots
  - Ramp would save roughly 5,000 sq m
    - Roughly half the wetlands
    - Save on cost of mitigation wetland: $45,000 + cost of land +contractor
    - Price for total flood control: $50,000 (variable) + contractor
- $22 million to buy and repair Central High School

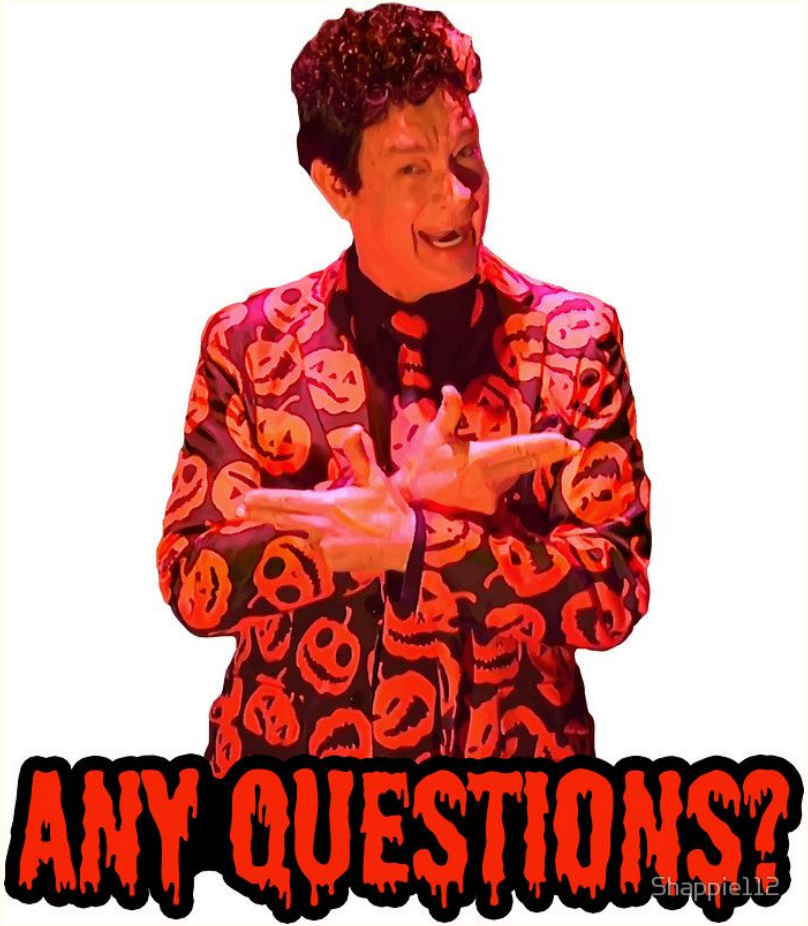
Conclusions

Want to build on wetland

Got shut down

Build on the wetland, but:

- Build vertically
- Build a parking ramp
- Create flood water holding system underground
- Build mitigation wetland nearby


ANY QUESTIONS?
Shappie112

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