



Methods Document:
Hennepin County Medical Center Whittier Clinic
West Virginia University

Research Fellow:

Shan Jiang, PhD, Assistant Professor of Landscape Architecture, West Virginia University

Research Assistant:

Sofija Kaljevic, M.Arch, PhD Candidate in Human and Community Development Program, West Virginia University

Firm Liaisons:

Kirsten Staloch, M.S., AIA Associate, EDAC, LEED Green Associate,
Austin Evert, Landscape Designer,
HGA Architects and Engineers

Participating Firm: HGA Architects and Engineers

Overview of CSI: This investigation was conducted as part of the Landscape Architecture Foundation's 2017 *Case Study Investigation* (CSI) program. CSI matches faculty-student research teams with design practitioners to document the benefits of exemplary high-performing landscape projects. Teams develop methods to quantify environmental, economic and social benefits and produce Case Study Briefs for LAF's *Landscape Performance Series*.

The full case study can be found at:

<https://landscapeperformance.org/case-study-briefs/whittier-clinic>



Slide 2

Diagram 1: HCMC Whittier Clinic Site Plan

Environmental Benefits

- **Manages 2,300,000 gallons or 88% of annual stormwater on-site. This represents an 86% reduction in stormwater runoff as compared to the former brownfield site.**

Reduces the site runoff by approximately 77% and reduces the site runoff intensity by 2.9 in/hr for a 50-year storm event as compared to a conventional scenario. Reduces annual runoff by 24.4 inches, reduces days per year with runoff by 39 days, and retains 58 more days of wet days as compared to a conventional scenario. The maximum rainfall retained by the current scenario is 3.56 inches more than a conventional scenario.

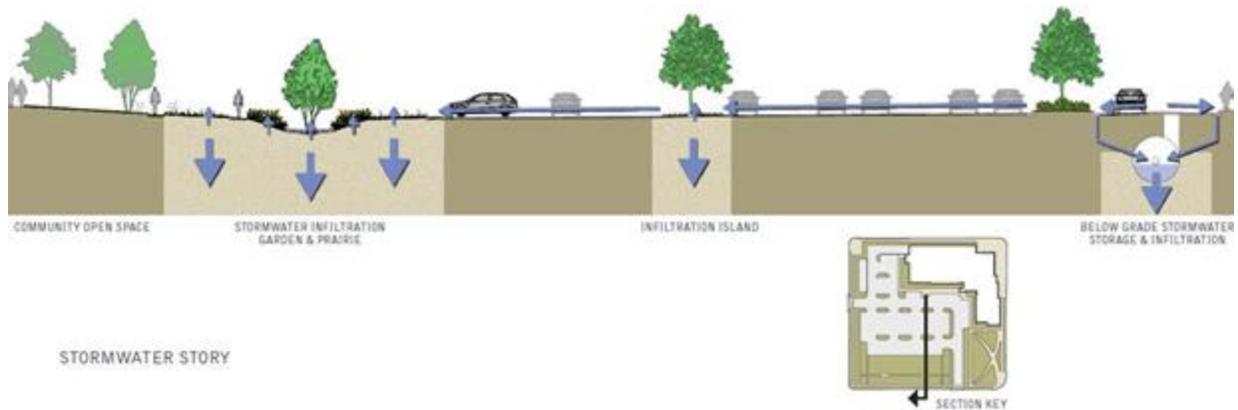


Diagram 2: Stormwater Management Strategy

Method:

Using the EPA’s National Stormwater Calculator (1.2.0.0 Beta MSI version), two site development scenarios were estimated. The current scenario is based on the current site design with LID practices, including a rain garden (Native Prairie), street planters and infiltration islands on the parking lot, and permeable paving in the community park area. The conventional scenario is a site design with impervious materials and no LID practices, which is very similar to the pre-development site conditions. Parameters needed for the calculations are listed in the following tables.

Current Scenario - Land Cover

Land Cover	Percentage (%)
Building	22
Vehicle Use	40
Total Impervious Areas	62
Lawn	2
Street Planter	18
Rain Garden	15
Pervious Paving	3
Total Pervious Areas	38
Site Total	100

As for the parameters inputted in the calculator:

Land Cover	Percentage (%)
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Lawn	38
Impervious	62

Current Scenario - LID Controls

LID Practice	What % of your site's impervious area will be treated by the following LID practices? (%)	Capture Ratio of the LID Practice (%)
1. Rain Garden	65	37
2. Street Planters	30	97
3. Permeable Pavement	5	97

1. Around 75% of the impervious areas will be treated by the rain garden. Therefore, $0.65 * 62 = 40.3\%$ of the site will be treated by the rain garden. Capture Ratio of the Rain Garden = Area of the LID/Treated Impervious Areas = $15/40.3 = 37\%$

2. Around 30% of the impervious areas will be treated by the street planters. Therefore, $0.3 * 62 = 18.5\%$ of the site will be treated by the street planters. Capture Ratio of the Street Planter = Area of the LID/Treated Impervious Areas = $18/18.5 = 97\%$

3. The permeable pavement treats 5% of the sit's runoff, therefore, $0.05 * 62 = 3.1\%$ of the site will be treated. Capture Ratio of the Permeable Pavement = Area of the LID/Treated Impervious Areas = $3/3.1 = 97\%$

Baseline Scenario – Land Cover

Land Cover	Percentage (%)
Total Impervious Areas	100

Calculation results are illustrated with charts and analyzed as following:

Statistic	Current Scenario	Baseline Scenario
Average Annual Rainfall (inches)	34.46	34.46
Average Annual Runoff (inches)	4.20	28.60
Days per Year With Rainfall	68.56	68.56
Days per Year with Runoff	10.89	50.77
Percent of Wet Days Retained	84.11	25.95
Smallest Rainfall w/ Runoff (inches)	0.43	0.10
Largest Rainfall w/o Runoff (inches)	0.81	0.20
Max. Rainfall Retained (inches)	4.15	0.59

Table 1: Stormwater Performance Comparison between Current Scenario and Baseline Scenario

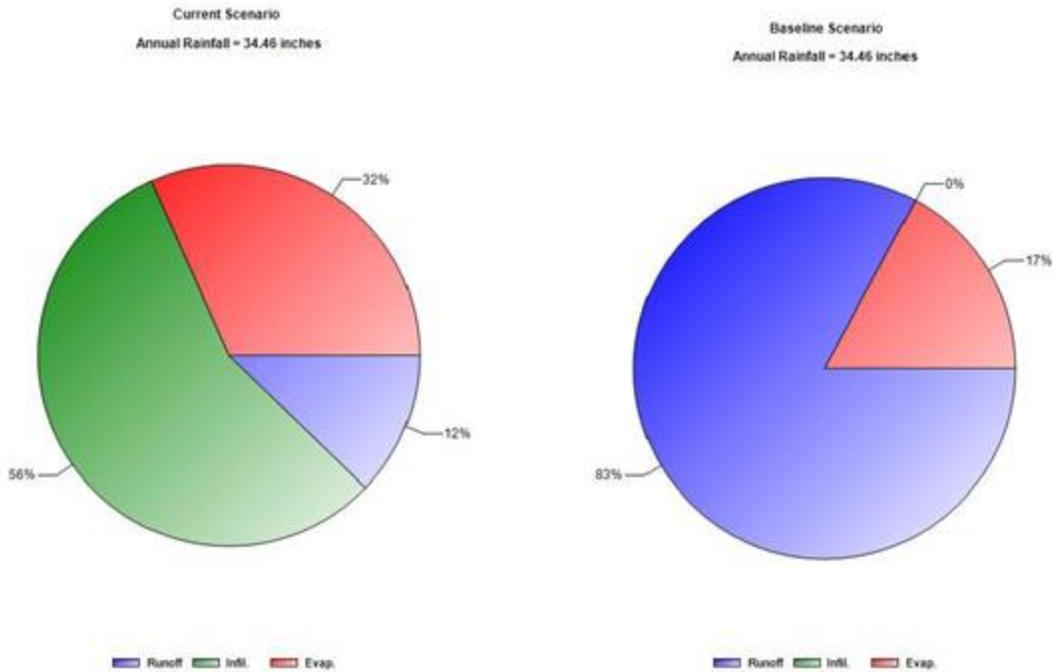


Chart 1: Stormwater Performance Comparison between Current and Baseline Scenario
 Managed stormwater runoff annually onsite in the current scenario is: 56% (infiltration) + 32% (evaporation) = 88%

Treatment Volume Conversion:

Average Annual Runoff Difference: $28.60 - 4.20 = 24.4 \text{ in} = 2.03333 \text{ ft}$

Runoff Volume = Runoff depth * drainage area

Reduction Volume = $2.03333 * 152,460 \text{ sf} = 310,001.492 \text{ cu ft}$, or $\sim 2,318,972.2$ gallons

Runoff reduction $(83\% - 12\%) / 83\% = 86\%$

Extreme Events:

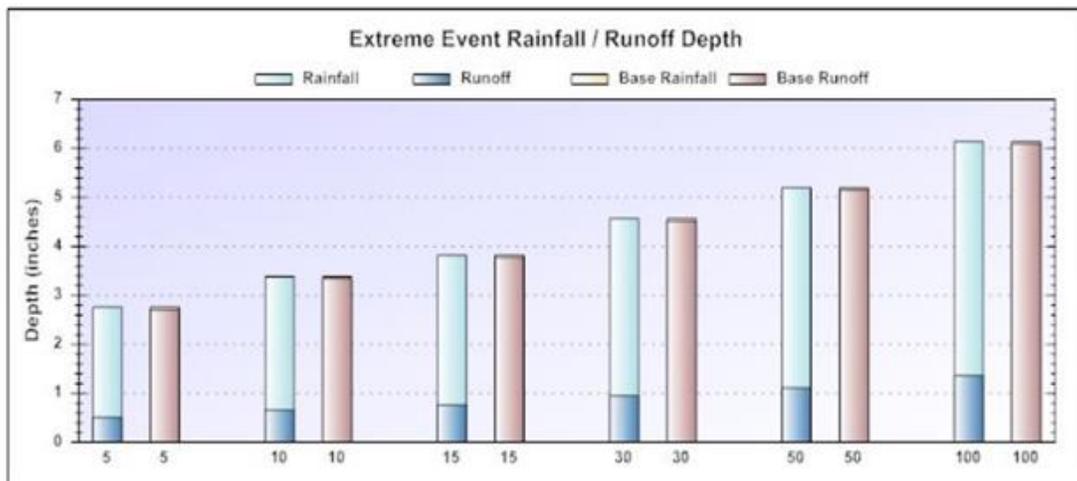


Diagram 3: Extreme event rainfall / runoff depth comparison between current scenario and baseline scenario

For a 50-year return period, the max daily rainfall depth for both the current scenario and baseline scenario is 5.2 inches. For the current scenario, the stormwater runoff depth is 1.2 inches max per day. For the baseline scenario, the stormwater runoff depth is 5.2 inches max per day. Therefore:

$$(5.2 \text{ inches} - 1.2 \text{ inches}) / 5.2 \text{ inches} = 77\%$$

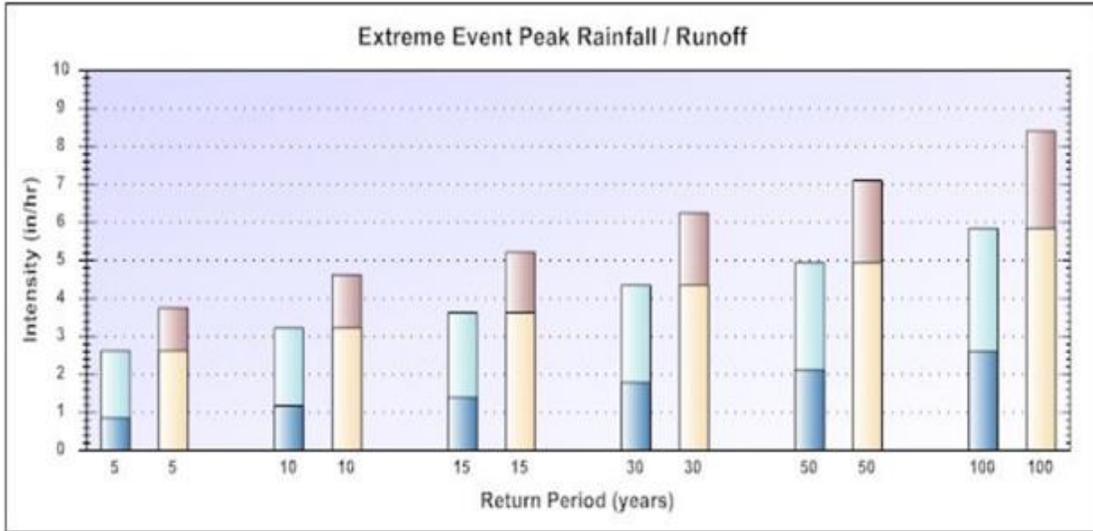


Diagram 4: Extreme event rainfall / runoff intensity comparison between current scenario and baseline scenario

For a 50-year return period, the peak runoff intensity is 2.1 in/hr for the current scenario, and 5 in/hr for the baseline scenario. Therefore,

$$5 \text{ in/hr} - 2.1 \text{ in/hr} = 2.9 \text{ in/hr}$$

Limitations:

To conduct calculations using EPA National Stormwater Calculator the portions of the land covers on the site are necessary. Because of information limitation the areas of various land covers were traced and measured using AutoCAD based on the construction documents provided by the design firm, hence, human errors were possible, which becomes a limitation to this part of the calculations.

Additionally, the site reduces stormwater runoff by 31.5% for a 2-year, 24-hour storm as compared to pre-development conditions.

Method:

Verified by LEED NCv2.2 Certified - Silver submittals provided by HGA Architects and Engineers, in a 2-year, 24 hour design storm event, the pre-development site runoff is 29,004 cf and the post-development site runoff is 19,868 cf.

(1) Calculations of pre-development site runoff water in gallons:

Pre-project site (135,400 sf) was 100% impervious covered with building roofs and pavement. Runoff from 2.8-in rainfall on impervious surface with Runoff Curve Number=98 is 2.57 in.

$$\text{Runoff} = 2.57\text{in} * 135,400 \text{ sf} * 1\text{ft}/12\text{in} = 29,004 \text{ cf}$$

$$29,004 \text{ cf} * 7.48 = 216,949.92 \text{ gallons}$$

(2) Calculations of post-project site runoff water in gallons:

Post-project site (135,400 sf) is 64.5% impervious (87,340 sf).

Runoff from 2.8-in rainfall on pervious surface with Runoff Curve Number=61 is 0.29 in.

$$\text{Runoff} = (2.57 \text{ in} * 87,340 \text{ sf} * 1/12) + (0.29 \text{ in} * 48,060 \text{ sf} * 1/12) = 19,868 \text{ cf}$$

$$19,868 \text{ sf} * 7.48 = 148,612.64 \text{ gallons}$$

The reduction in site runoff is $(29,004 \text{ cf} - 19,868 \text{ cf}) / 29,004 \text{ cf} = 31.5\%$.

Source: HCMC Whittier LEED Certificate Submittals

Limitations:

This calculation was conducted directly by the design firm and certain details are difficult to track. This calculation method may result in a conservative estimation of reduced stormwater runoff in such a designed event.

- **Saves approximately 554,600 gallons of potable water annually with the use of a weather-based sensor controller for irrigation, saving \$2,617 annually.**

Methods:

Calculation was conducted using Hunter Weather-Based Controller Water Saving Calculator. Total irrigated area is 54,938 sf. Diagram 5 compares the conventional water requirement (baseline case with conventional controller that assumes no rain shut-off device) and the design case (with ET sensor installed). And the annual irrigation water savings for the design is 554,566 gallons.

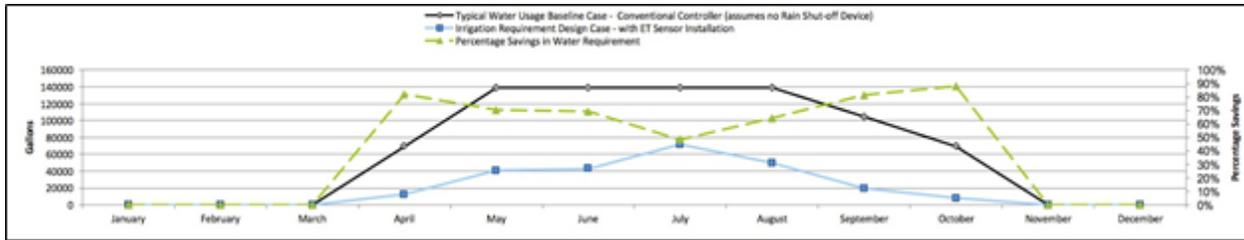


Diagram 5: Irrigation Water Comparison between Typical Usage Baseline Case and Design Case with ET Sensor Installation

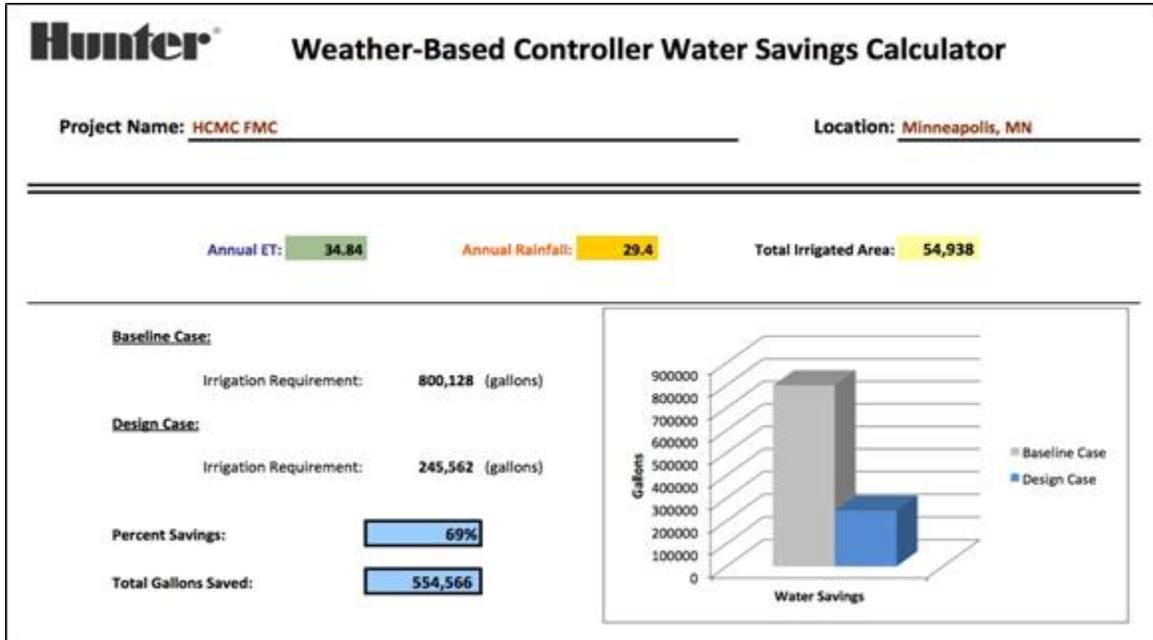


Diagram 6: Water Saving Calculation

Potable water price is \$3.53 per unit (748 gallons) in 2017, and the saved monetary value of reduced landscape water equals:

$$554,566 \text{ gallons} / 748 * \$3.53 = \$2,617 \text{ annually}$$

Sources: Minneapolismn.gov, HGA Architects and Engineers

- Sequesters approximately 14,600 lbs of atmospheric carbon annually in newly-planted trees. The tree canopies also intercept approximately 64,700 gallons of stormwater annually.

Methods:

(1) Calculations of stormwater runoff intercepted by newly planted tree canopy for the whole project area, using i-Tree Design v6.01, was based on the Plant Materials Schedule provided by HGA Architects and

Engineers. Intercepted stormwater and reduced carbon dioxide by newly planted trees are listed on the below table:

Key	Common Name	Botanical Name	DBH (inches)	Quantity of Trees	Intercepted Stormwater Yearly (gallons)	Total Intercepted Stormwater Yearly (gallons)	Reduced Atmospheric Carbon Dioxide Yearly (CO2) (pounds)	Total Reduced CO2 Yearly (pounds)
Trees								
AF	Autumn Blaze Maple	<i>Acer x freemanii 'Jeffersred'</i>	6	13	300	3900	45	585
BN	Heritage River Birch	<i>Betula nigra 'Cully'</i>	6	4	304	1216	99	396
BP	Renaissance Reflection Birch	<i>Betula papyrifera 'Renci'</i>	6	8	304	2432	41	328
OV	Ironwood	<i>Ostrya virginiana</i>	6	7	317	2219	65	455
QB	Swamp White Oak	<i>Quercus bicolor</i>	6	18	317	5706	37	666
QE	Northern Pin Oak	<i>Quercus ellipsoidalis</i>	6	6	301	1806	97	582
RP	Purple Robe Locust	<i>Robinia pseudoacacia 'Purple Robe'</i>	6	3	304	912	99	297
TA	Sentry American Basswood	<i>Tilia americana 'McKSentry'</i>	6	4	236	944	40	160
Ornamental Trees								
AC	Rainbow Pillar Serviceberry	<i>Amelanchier canadensis 'Glenform'</i>	4	9	138	1242	40	360
AG	Autumn Brilliance Serviceberry	<i>Amelanchier x grandiflora 'Autumn Brilliance'</i>	4	27	138	3726	40	1080
Shrubs								
AM	Autumn Magic Chokeberry	<i>Aronia melanocarpa 'Autumn Magic'</i>	4	10	58	580	13	130
CS	Isanti Dogwood	<i>Cornus sericea 'Isanti'</i>	4	15	58	870	32	480
DL	Dwarf Bush Honeysuckle	<i>Diervilla lonicera</i>	4	81	58	4698	13	1053
HP	Little Lamb Hydrangea	<i>Hydrangea paniculata 'Little Lamb'</i>	4	6	58	348	13	78
JM	Maney Juniper	<i>Juniperus chinensis 'Maneyi'</i>	4	12	157	1884	10	120
JJ	Mint Julep Juniper	<i>Juniperus chinensis 'Manlep'</i>	4	20	157	3140	10	200
JS	Arcadia Juniper	<i>Juniperus sabina 'Arcadia'</i>	4	5	157	785	10	50
JSM	Medora Juniper	<i>Juniperus scopulorum 'Medora'</i>	4	7	157	1099	10	70
MD	Northern Pride Russian Cypress	<i>Microbiota decussata 'Northern Pride'</i>	4	35	157	5495	12	420
RA	Gro-Low Fragrant Sumac	<i>Rhus aromatica 'Gro-Low'</i>	4	132	58	7656	35	4620
RN	Nearly Wild Rose	<i>Rosa 'Nearly Wild'</i>	4	72	58	4176	13	936
RPP	Pavement Purple Rose	<i>Rosa 'Pavement Purple'</i>	4	38	58	2204	13	494
RT	Tiger Eye Sumac	<i>Rhus typhina 'Baltiger'</i>	4	16	58	928	35	560
TC	Emerald Spreader Yew	<i>Taxus cuspidata 'Monloo'</i>	4	27	157	4239	12	324
TM	Taunton Yew	<i>Taxus x media 'Taunton'</i>	4	16	157	2512	12	192
Total					591	64717		14636

Table 2: HCMC Whittier Clinic Tree Benefits Calculation

(2) Calculation of Indirect Monetary Climate Benefits

Use the lower bound carbon price: EU ETS Carbon Price of \$0.00756/lb CO2 to estimate the monetary value (CNT, 2010):

$$14,636 \text{ lbs} * \$0.00756/\text{lb} = \$110.65 \text{ monetary value of the total annual climate benefits}$$

Use the upper bound carbon price: EU ETS Carbon Price of \$0.0386/lb CO2 to estimate the monetary value (CNT, 2010):

$$14,636 \text{ lbs} * \$0.0386/\text{lb} = \$564.95 \text{ monetary value of the total annual climate benefits}$$

Limitations:

Some tree species were not listed in the i-Tree calculator, as a result, we have to select similar species as substitutes to make an estimation. The equation and multipliers used to estimate monetary climate benefits were developed in 2010 by Center for Neighborhood Technology. An up-to-date formula is lacking in this part of estimation.

Social Benefits

- Improves satisfaction with their work environment through engagement with nature for 100% of 13 interviewed staff members.

Methods:

One focus group interview was conducted onsite to explore usage of the three garden spaces as well as user perceptions and attitudes. 13 user representatives attended the discussion. Demographic information of the participants is described in Table 7. The focus group was structured according to a list of predetermined questions as shown in the Appendix.

Age Group	Number
18-29 years old	1
30-49 years old	7
50-64 years old	3
Above 65 years old	2

Age Group	Number
Female	12
Male	1

Professional Background	Number
Administrator	1
Clerk	1
Doctor	1
Educator	1
Medical Assistant	5
Nurse	3
Social Worker	1

Table 7: Demographic Information of Focus Group Participants at HCMC Whittier Clinic

Through content analysis of the focus group transcript, 241 total codes were identified that fall into 4 topics, including (1) general descriptive topics, (2) overall usage preference and attitude, (3) user behaviors and activities, and (4) domains of garden restorativeness and design features. Each topic covers several sub-topics. Details and frequencies of discussion are listed in Table 8.

Topic Type	Sub-Topic	Number of Codes	Frequency of Discussion	Frequency of Discussion Sum
General Descriptive	Site and Location	32	13%	13%
	Users	17	7%	7%
Overall Usage Preference and Attitude	Positive Perception/Attitude	23	10%	15%
	Negative Perception/Attitude	14	5%	

User Behaviors and Activities	Existing Behaviors/Activities	21	9%	13%
	Desired Behaviors/Activities	9	4%	
Domains of Garden Restorativeness and Design Features	Access and Visibility	31	13%	52%
	Nature Engagement	19	8%	
	Path and Paving	1	0	
	Places to Rest	14	6%	
	Sense of "Being Away"	3	1%	
	Aesthetics and Maintenance	21	9%	
	Other Desired Features	29	12%	
	Sustainable Design	7	3%	

Table 8: Focus Group Transcript Content Analysis Results

Generally, clinic staff uses the most of the garden spaces for activities such as walking and daily exercises (as 4 out of 13 participants reported), and looking at nature from within the building. Local community residents pass by the gardens, sit on benches for short-term relaxation, or go across the property to take a shortcut to surrounding restaurants. Patients typically wait inside and look out of the window, and occasionally use the building front areas to wait for being picked up. Group events and public use are not common on the site, and participants mentioned that patients could not use the Native Prairie area because of low accessibility and walkability.

“I think staff use most of the space. Everyone else just comes in, finds their goal, and gets out. Whenever I look out there I see staff.”

“I’ve seen people walk through the parking lot and sitting out there (Community Park), I’m not sure if they are patients or not. It could be someone just walking here and stopping...”

Positive attitudes about the gardens majorly focused on the overall design strategy that incorporates various nature spaces in the property and abundant natural light for the building interiors. User comments say:

“I’m just gonna to say that I love looking at the community garden area, I just feel good. I like all of it very much, but there are something very special about the grasses and about the native plants...there are so much nature integrated in that space that I really appreciate.”

“When we build this building, it’s a new building...it has a rain garden to filter the stormwater, it was something that everyone is very proud of. So I actually really like it. I know it’s not that flashy, but it makes people feel good.”

“Compared to our previous clinic, we didn’t have any garden, no green. Compared to that, this is much better.”

“I used to work with XXX, it was so dark, we had hardly any natural light. So that’s one of the things we asked for: abundant natural light, and a sense of connection with nature. We have so much more of that and I feel we are really rich in that way.”

Negative attitudes about various outdoor spaces mainly focused on four topics: (1) a lack of “inviting” features to make the space a destination, (2) unpleasant views to the roof of a shelter at the main entrance from the building interiors, (3) a lack of bright colors and flowering species that bloom in different seasons, and (4) low walkability from the clinic building to the Native Prairie area.

“And it will be interesting to think about what would draw us to the outside in there. I think that’s retreating ourselves, because it’s part of mentality and stress management to take a few minutes, two minutes, to look outside. But we are often...sitting all day. So I think a piece of it is the retreating ourselves, because it’s hard to take a few minutes from ourselves. I don’t know how the landscapes could help us in that way. But people said there could be something more attractive to overpower that.”

“I was never close to the window and now I am and I take the yoga classes, and that (the roof) is ugly...distracts the whole group”.

“So if there were something like a waterfall, something like them, I would find a reason to go out there and just sit, look at the water, whatever. This is almost like if we are walking around the building, around the block, I would probably sit down somewhere but probably not since it’s so sunny there and there is nowhere to sit and avoid the sun.”

Access and visibility is the most discussed topic among the domain of garden restorativeness and design features (31 times mentioned, which makes up 13% of the total discussion). People enjoy the views and abundant natural light from the building interior but wish to improve the accessibility and walkability to the Native Prairie area, or have a green space that is close to the building entrance to maximize the usage for patients.

“Patients not being able to walk from the building to the Native Prairie area because there is no natural walkway. Like kids, and strollers want to hang out, they wouldn’t go across the parking lot to get there.”

Places to rest is another highly discussed topic, 6% of the total discussion. Users commented that there is a lack of variety of seating options, shade, and picnic tables.

For nature engagement, participants appreciated the natural environment that brings abundant green to the clinic environment. However, someone mentioned that they wish the trees could be bigger and provide more shade. In terms of plant selection, participants suggested more varieties of flowering species and colors. This matters the aesthetics and maintenance domains as well. “Color” subtopic was mentioned 11 times (5%) during the discussion.

“I love the oak trees that are around the parking lot. They change color in the fall and they are beautiful!”

“The trees branches are too low, people feel a lack of understory space”.

“The space overall is green and grey. There is a lack of much color.”

“It will be good to have some pop out color there, you know, something red, like dogwoods”, “some nice cherry blooms”, and “some perennials that bloom in different times”.

“We used to have some at the area where the picnic table is, they died, there were actually bush roses, and they died, and they took them off and just put grass in there. It would be good to have flowers that bloom in different times and people can look at.”

Another finding through the focus group discussion is that there is an insufficient awareness among the public about the employment of sustainable principles on the site design. Incorporating signage may help educating the publics and improving the level of acceptance of sustainable designs.

● **Provides a significant level of restorativeness for users, achieving a GATE score for nature engagement of 7.9 for the Community Park, 8.4 for the Native Prairie, and 7.2 for the Pocket Park, based on a 10-point scale.**

Additional Social Benefit:

● **Achieves a GATE score in the domain “sense of being away” of 6.1 for the Community Park, 6.1 for the Native Prairie, and 6.2 for the Pocket Park, based on a 1-10 scale.**

Methods:

Three landscape areas were evaluated using the Garden Assessment Tool for Evaluators (GATE) (Sachs, Cooper Marcus & Barnes, 2016), including (1) Community Park, (2) Native Prairie (the rain garden), and (3) Pocket Park. Three evaluators conducted the evaluations onsite. There are five domains that measures the level of restorativeness of the given space, including (1) Access and Visibility, (2) Sense of “Being Away”, (3) Nature Engagement, (4) Walking and Activities, and (5) Places to Rest.

(1) Background: Three evaluators conducted evaluations onsite using an individual scale to each of the mentioned gardens. Mean scores for each domain was calculated. Background information for the evaluation activities, as well as evaluators, are shown in Table 3. Within each domain there are sub-

domains that cover multiple design variables. Scoring details of the sub-domains are demonstrated in the following tables. The overall restorativeness score for each of the areas was calculated, as indicated by the “Actual GATE Score”.

Name of Facility and Location	Type of Facility or Patients Served	Evaluated Gardens in the Facility	Evaluation Date	Weather
Hennepin County Medical Center Whittier Clinic, Minneapolis, MN	Outpatient Clinic and Specialists	(1) Community Park (2) Native Prairie (3) Pocket Park	6/15/2017	Sunny, Windy

Name of Garden	Location and Type of Garden	Evaluator	Role of Evaluator	Evaluation Time	Temperature (F)
(1) Community Park	South east of front entry (patient entry)	A	Researcher	8:50 AM	73
		B	Landscape Designer	9:20 AM	73
		C	Medical Planner	9:43 AM	71
(2) Native Prairie	South edge of the property as street buffer, by the parking lot	A	Researcher	10:15 AM	78
		B	Landscape Designer	9:40 AM	73
		C	Medical Planner	9:59 AM	71
(3) Pocket Park	Northwest corner of the property, at street intersection	A	Researcher	2:05 PM	82
		B	Landscape Designer	10:00 AM	75
		C	Medical Planner	10:30	71

Table 3: Site Background and Evaluator Information

(2) Complete evaluation scores using Garden Assessment Tool for Evaluators (GATE) toolkit for all garden areas are listed below.

HCMC Whittier Clinic, Minneapolis MN – Community Park

Total Max: 344 Total Actual: 199.3 Percentile: 58%

Intuitive Restorativeness Score: 6.7

Actual GATE score (converted to a 1-10 scale): 5.8

Domain 1		Total Max	Mean	Percentile	Sum	Percentile
Access & Visibility	Visual Access to the Garden	36	19.8	55%	41.1	57%
	Physical Access to the Garden	36	21.3	60%		

Domain 2		Total Max	Mean	Percentile	Sum	Percentile
Sense of “Being Away”	Sense of “Being Away”	20	11.6	58%	29.2	61%
	Aesthetics & Maintenance	28	17.6	63%		

Domain 3		Total Max	Mean	Percentile	Sum	Percentile
Nature Engagement	Plantings	40	31.6	79%	35.9	53%
	Other Natural Features (e.g., water features)	28	4.3	15%		

Domain 4		Total Max	Mean	Percentile	Sum	Percentile
Walking & Activities	Primary Walkway (Path or Paved Thoroughfare)	24	17.4	72.5%	48.1	63%
	All Paved Areas	16	11	69%		
	Lighting, Wayfinding, & Amenities	20	8.7	43.5%		
	Variety & Activities	16	11	69%		

Domain 5		Total Max	Mean	Percentile	Sum	Percentile
Places to Rest	Seating Availability & Type	20	13.3	66.5%	45	56%
	Private or Social	20	15.3	76.5%		
	Aesthetics & Sun	20	15.4	77%		
	Tables	20	1	5%		

Table 4: GATE Score of Community Park at Whittier Clinic, Minneapolis MN

HCMC Whittier Clinic, Minneapolis MN – Native Prairie

Total Max: 344 Total Actual: 183.3 Percentile: 53%

Intuitive Restorativeness Score: 7.3

Actual GATE score (converted to a 1-10 scale): 5.3

Domain 1		Max Total	Mean	Percentile	Sum	Percentile
Access & Visibility	Visual Access to the Garden	36	20	56%	30.6	42.5%
	Physical Access to the Garden	36	10.6	29%		

Domain 2		Max Total	Mean	Percentile	Sum	Percentile
Sense of “Being Away”	Sense of “Being Away”	20	11.6	58%	29.3	61%
	Aesthetics & Maintenance	28	17.7	63%		

Domain 3		Max Total	Mean	Percentile	Sum	Percentile
Nature Engagement	Plantings	40	33.7	84%	38.4	53%
	Other Natural Features (e.g., water features)	28	4.7	17%		

Domain 4		Max Total	Mean	Percentile	Sum	Percentile
Walking & Activities	Primary Walkway (Path or Paved Thoroughfare)	24	14.6	61%	38.5	51%
	All Paved Areas	16	8.9	56%		
	Lighting, Wayfinding, & Amenities	20	6	30%		
	Variety & Activities	16	9	56%		

Domain 5		Max Total	Mean	Percentile	Sum	Percentile
Places to Rest	Seating Availability & Type	20	13.4	67%	46.5	58%
	Private or Social	20	16	80%		
	Aesthetics & Sun	20	16.1	80.5%		
	Tables	20	1	5%		

Table 5: GATE Score of Native Prairie at Whittier Clinic, Minneapolis MN

HCMC Whittier Clinic, Minneapolis MN – Pocket Park

Total Max: 344 Total Actual: 183.3 Percentile: 50%

Intuitive Restorativeness Score: 3.3

Actual GATE score (converted to a 1-10 scale): 5.0

Domain 1		Max Total	Mean	Percentile	Sum	Percentile
Access & Visibility	Visual Access to the Garden	36	12.7	35%	29	40%
	Physical Access to the Garden	36	15.7	44%		

Domain 2		Max Total	Mean	Percentile	Sum	Percentile
Sense of “Being Away”	Sense of “Being Away”	20	13	65%	29.7	62%
	Aesthetics & Maintenance	28	16.7	60%		

Domain 3		Max Total	Mean	Percentile	Sum	Percentile
Nature Engagement	Plantings	40	28.7	72%	32.4	48%
	Other Natural Features (e.g., water features)	28	3.7	13%		

Domain 4		Max Total	Mean	Percentile	Sum	Percentile
Walking & Activities	Primary Walkway (Path or Paved Thoroughfare)	24	19.3	80%	42	55%
	All Paved Areas	16	11	69%		
	Lighting, Wayfinding, & Amenities	20	3.7	18.5%		
	Variety & Activities	16	8	50%		

Domain 5		Max Total	Mean	Percentile	Sum	Percentile
Places to Rest	Seating Availability & Type	20	11.7	58.5%	42	56%
	Private or Social	20	15.3	76.5%		
	Aesthetics & Sun	20	14	70%		
	Tables	20	1	5%		

Table 6: GATE Score of Pocket Park at Whittier Clinic, Minneapolis MN

Visibility and accessibility scores of the three gardens are not high since the gardens are not closely attached to the clinic building. They were designed for not just the clinic residents but also the local community. During the site observation, it was identified that community residents and non-patients passed through the property and used the three garden areas for short-time relaxing and leisure activities. However, to encourage staff use of outdoor spaces gardens should be strategically located at various spots onsite, some close to the clinic building, and some close to the property boundary that incorporates public use.

Providing privacy in certain areas could contribute to a better “sense of being away” to users. Since the property is located in an urbanized area along Nicollet Ave, a main street connecting to restaurants and business districts, unpleasant sounds, odors, and traffic views are inevitable from certain gardens, especially the Pocket Park.

All three gardens earned high scores on Nature Engagement – Plantings subdomain because the majority of the ground surfaces are planted and well maintained. The gardens all have a rich variety of plants that stimulate the senses. Adding year-round interests and bright colors to the planting design, and a destination feature (e.g., water feature) will improve the score for nature engagement domain.

Walkways that are wide-enough, smooth, and clear of debris (e.g., twigs, leaves, etc.) will improve the use of the gardens for walking and activities. Incorporating lightings will encourage night usage and improve the sense of safety of the gardens.

In terms of places to rest, a variety types of seating will contribute to higher scores for all the three parks. Providing shade and picnic tables will attract people to sit and have lunch.

Economic Benefits

- **Created an estimated 138 jobs associated with project construction, about 6 of which were directly associated with landscape construction.**

Methods:

Construction cost for the whole project of HCMC Whittier Clinic is: \$17,332,800, and the site construction is \$765,382 of that (all in 2011 dollars). Regional Industrial Multiplier System II (RIMS II) economic input-output model was developed by the Bureau of Economic Analysis (BEA) to estimate the number of jobs associated with the project construction and more specifically, the site and landscapes construction.

Construction is a final good, so final demand for the site construction equals the actual construction cost for this portion. The Employment Multiplier is the number of jobs created per million dollars of real final demand, using Minnesota as the final demand region, the multiplier is 9.00 (BEA RIMS II multiplier). Multipliers are based on the 2007 Benchmark Input-Output Table for the Nation and 2015 regional data.

As reported by Bureau of Labor Statistics, the Consumer Price Indexes for 2007 is 2.8, for 2011 is 3.15 (Bureau of Labor Statistics Data).

Equation:

$$\text{Total employment} = \text{construction cost as final demand} \div 1,000,000 \times \text{CPI}_{2007}/\text{CPI}_{2011} \times \text{employment multiplier}$$

Total number of jobs associated with the project construction = $17,332,800/1,000,000 * 2.8/3.15 * 9 = 138.66$

Number of jobs associated with site and landscape construction = $765,382/1,000,000 * 2.8/3.15 * 9 = 6.12$

Limitations:

Using the bill-of-goods method will be the best approach for estimating impacts because RIMS II multipliers for the construction industry are based on national averages across a wide variety of construction projects. Type I multipliers were employed in the calculation for a conservative estimation because of a lack of detailed information.

Additional Economic Benefit:

- **The Whittier Family Clinic employs approximately 110-120 people and generates approximately \$64,731 in annual property taxes to the county.**

Methods:

Verified by the documents provided by HGA Architects and Engineers and Minnesota Pollution Control Agency.

Limitations:

These are the benefits generated by the whole clinic, not just the landscape of the property. The data is from May 2011.

Source: <https://www.pca.state.mn.us/waste/cleanup-stories/whittier-clinic>

HCMC Whittier Clinic Focus Group Interview Predetermined Questions

Part 1: Demographic Information

1. What is your age?
2. What is your gender?
3. What is your role/professional background (nurse, medical officer, etc.)?
4. How many years of experience have you had in this current job?
5. How many years have you worked in this health facility?

Part 2: Usage of General Green Spaces of the Hospital

1. Which part of the green spaces on campus and what specific gardens/courtyards do you use the most during staying in the facility, and how do you use them?
2. What are the feelings or emotional status when and after you use the green spaces, try to use some adjectives to describe the feelings?
3. Regarding visibility and accessibility aspects, how do you perceive the green spaces from major indoor areas such as major corridors, waiting areas, dining areas, and patient wards?
4. How do you usually interact with design features in the green spaces, including planting, seats, paving, water feature, sculpture, etc., and have you found any facilitators/barriers to the use of the space?
5. For hospital employee: how do you think the having various green spaces on campus could impact your work performance and satisfaction about the physical environments of your workplace.
6. For family members and hospital visitors: how do you think having various green spaces on campus could impact your satisfaction about the hospitalization environment?
7. Do you have any additional comments about the green spaces on campus?