

The Business Case: *Sustainable Return on Investment*

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Valuation of Ecosystem Services

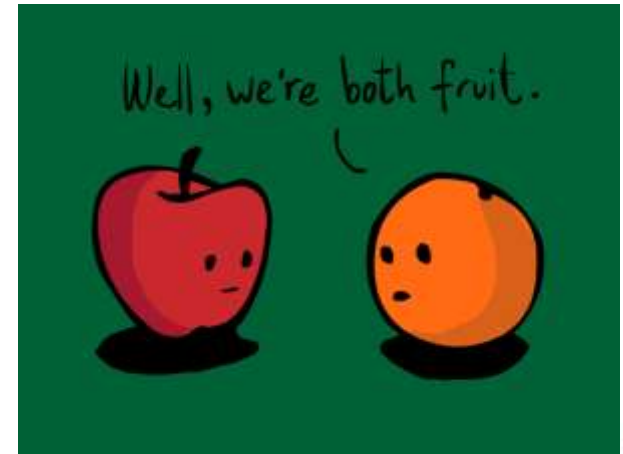


Triple Bottom Line



We can quantify this.

How do we quantify these?



Autocase by II Impact Infrastructure

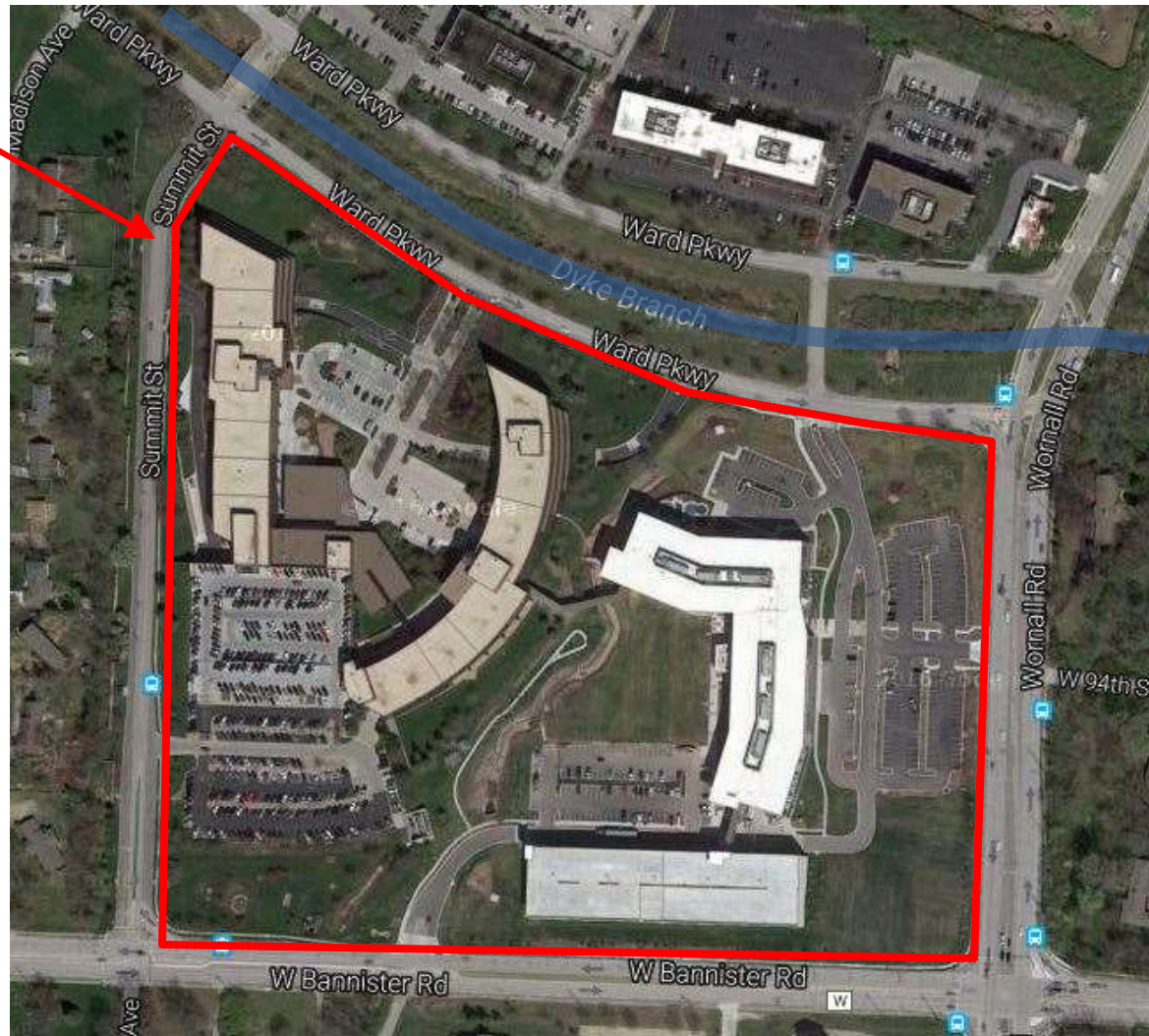
- ▶ Decision support software
- ▶ Useful tool for comparing alternatives
- ▶ Monetizes social & environmental benefits
- ▶ For Green Infrastructure
 - Regularly updated
 - Commercial launch - 1st Quarter, 2017
- ▶ Impact Infrastructure Previous Projects & Clients
 - City of Tucson / Pima County
 - Trinity River Vision Authority
 - Los Angeles District Water & Power
 - City of San Francisco
 - City of Dallas
 - New York City MTA



Autocase

Case Study: Burns & McDonnell WHQ Campus

Site: 35 ac.



Campus Expansion



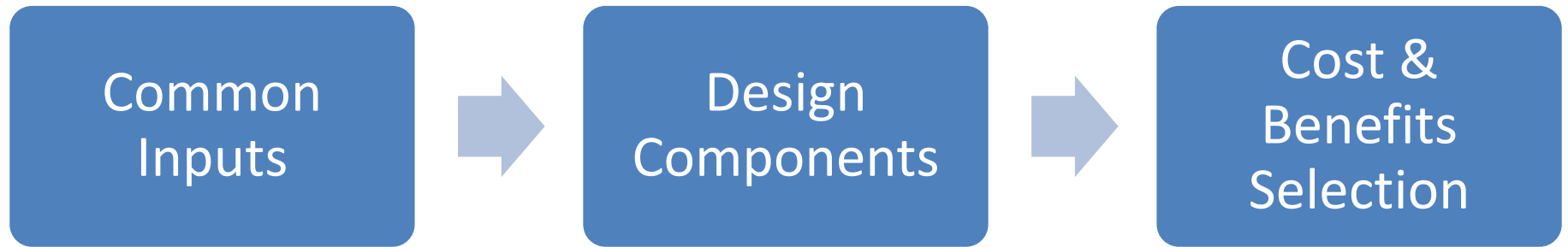
Examples of Green Infrastructure



Green Infrastructure

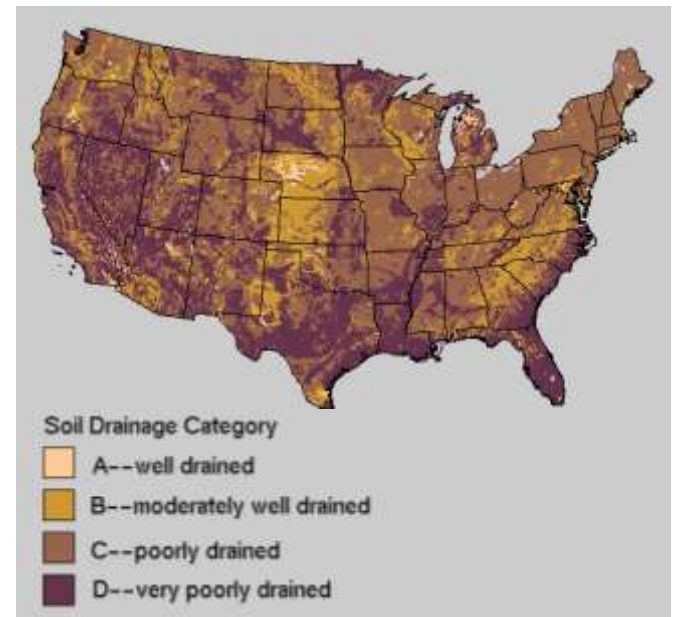


Modeling Steps



Common Inputs

- ▶ Location
- ▶ Project Timeline
- ▶ Soil Type
- ▶ Design Storm



Project Details

Location

Location * ⓘ

Kansas City, MO, United States

Project City

AutoCASE Location

Kansas City, MO, US

Dates

Project Start Date * ⓘ

2014-06-01

Start Date

Operations Duration * ⓘ

25

Years

Construction Duration ⓘ

22

Months

Planning Duration ⓘ

0

Years

Project Durations

Saved

General Site Information

General Site Questions

◀ Previous Next ▶



General Site Questions

Hydrologic Soil Group

* Required Field

What is the dominant soil type on the site? * ?

C

24 hour design storm * ?

1.37

Inches

Saved

**Design Storm
From MARC/APWA
BMP Manual**

Design Components

- ▶ Green Infrastructure (GI)
- ▶ Pavement surfaces
 - Parking Lots
 - Sidewalks and Drives
- ▶ Roofs
- ▶ Turf



Bioretention / Rain Garden Feature

Bioretention/Rain Garden

* Required Field

Name of Feature *

Rain Garden

Area *

4899

Square Feet

New / Existing

New

Maximum Ponding/Treatment Depth

6

Inches

Depth of Coverage Materials

12

Inches

Percent Empty Space in Material

30

Percent

Rate of Grey Discharge from Outlet of Feature

Cubic Feet per Second

Does this feature allow for infiltration?

Yes

Feature Area

Existing Features

9450 Patios/Piazas	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9450 Concrete Drives	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9300/9400 Turf Lawn	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Bioswale	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rain Garden	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Bioretention Area #1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Bioretention Area #2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
STP #4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Ponding Depth
Media Depth
Void Space


























Cost & Benefits Selection

- ▶ Carbon Emissions
- ▶ Water Quality
- ▶ Flood Mitigation
- ▶ Heat Island Effect

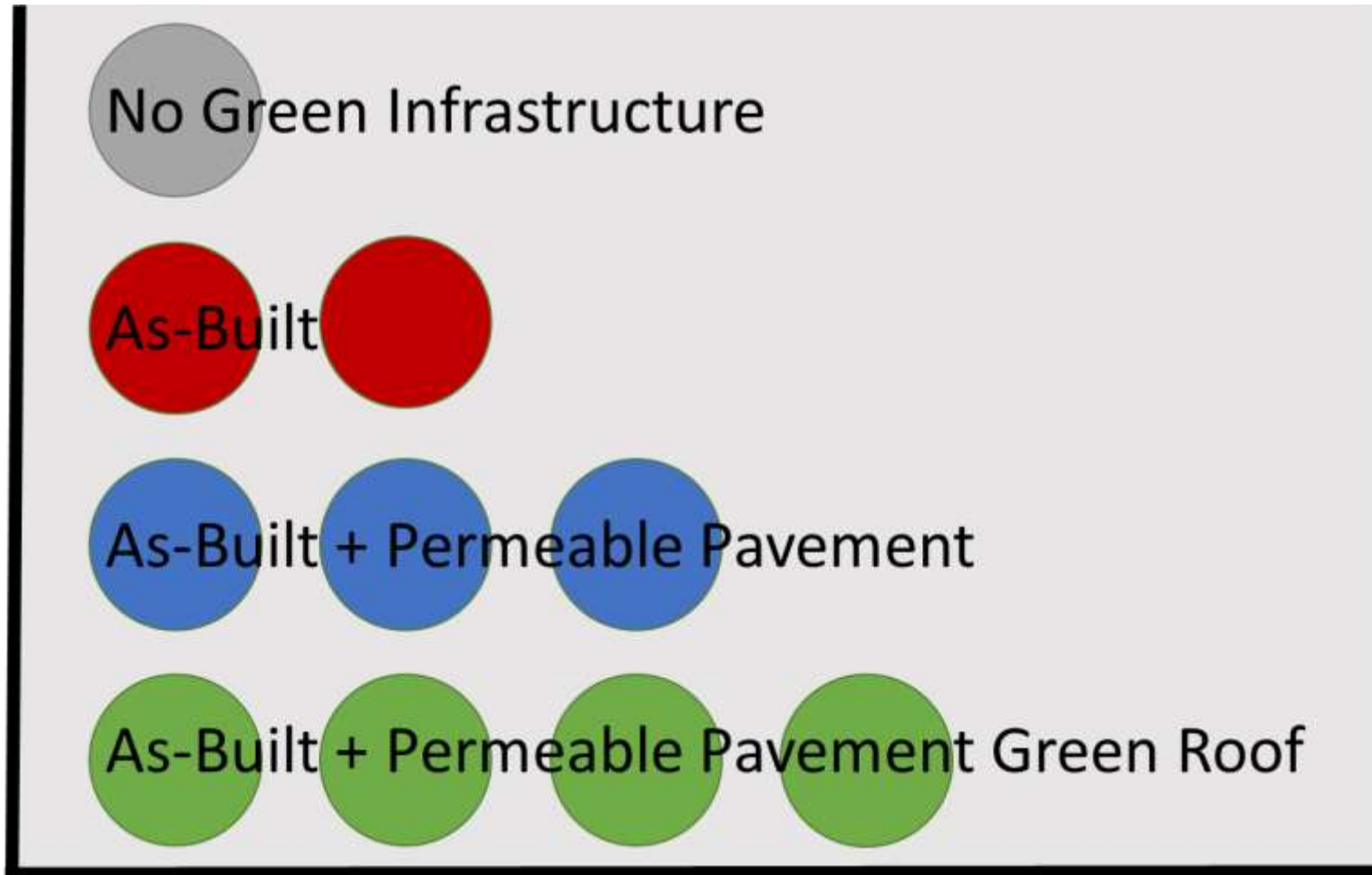


Potential Criteria

Common Inputs Design Components Additional Inputs ⚙️

 Capital Expenditure	 Capital Expenditure on Additional Piping	 Capital Expenditure on Additional Detention	 Operations & Maintenance	 Operations & Maintenance (O&M) on Additional Piping	 Operations & Maintenance (O&M) on Additional Detention
 Water costs	 Replacement Costs	 Wetlands Value	 Property Value Uplift	 Flood Risk Mitigation	 Heat Island Effect
 Air Pollution	 Carbon Emissions	 Recreational Value	 Shadow Wage Benefit	 Revenues	 Recurring Subsidies
 Regulatory Penalties	 One Time Subsidies	 Other Costs	 Other Benefits	 Decommissioning	 Water Quality Uplift
 Residual Value of Assets					

Design Alternatives



No Green Infrastructure



As-Built



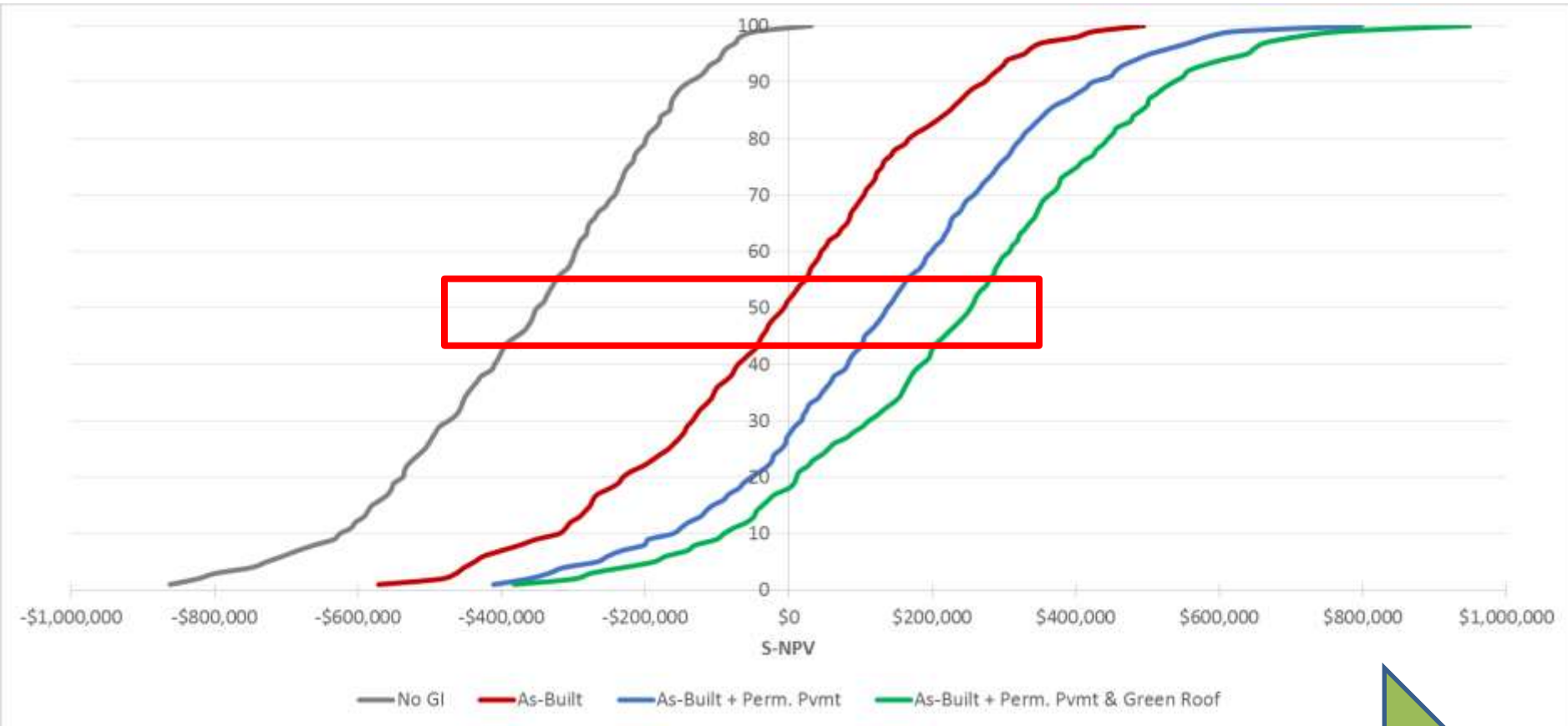
As-Built + Permeable Pavement



As-Built + Permeable Pavement + Green Roof




























Comparison of Design Alternatives



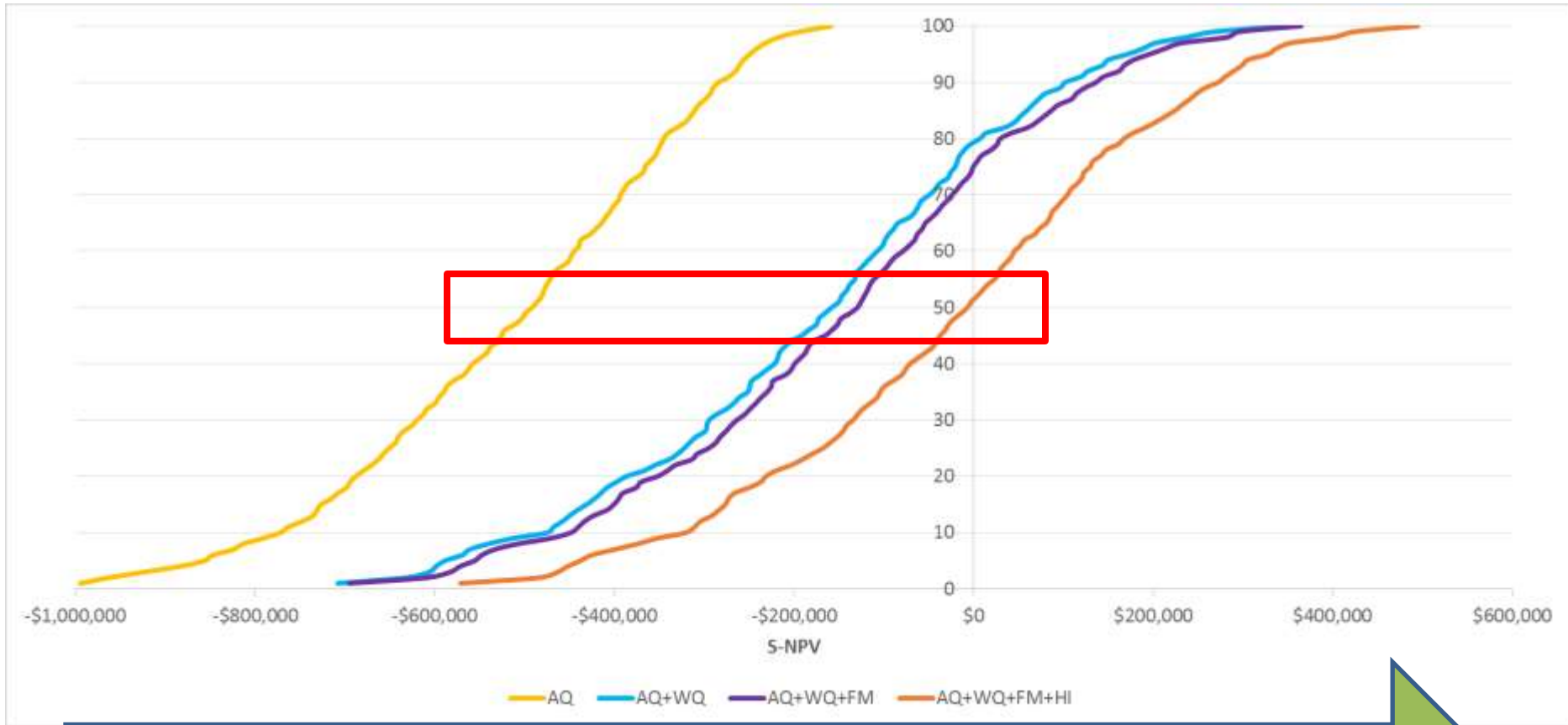
More Green Infrastructure

Evaluation Parameters

Common Inputs Design Components Additional Inputs ⚙️

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 Residual Value of Assets					

Effects of Evaluation Parameters



Additional Parameters

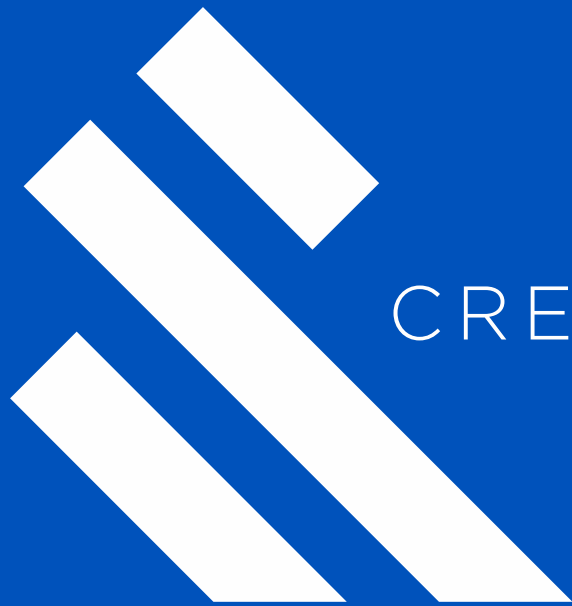
Take-aways

- ▶ Monetized values
 - Environmental/Social Impacts related to Capital and O&M costs
- ▶ AutoCASE for Green Infrastructure
- ▶ Key steps



- ▶ Apply Process
 - Decision support software





CREATE AMAZING.