



CITY OF
TUCSON

The Business Case for Low Impact Development



Shari Awalt
Van Patterson

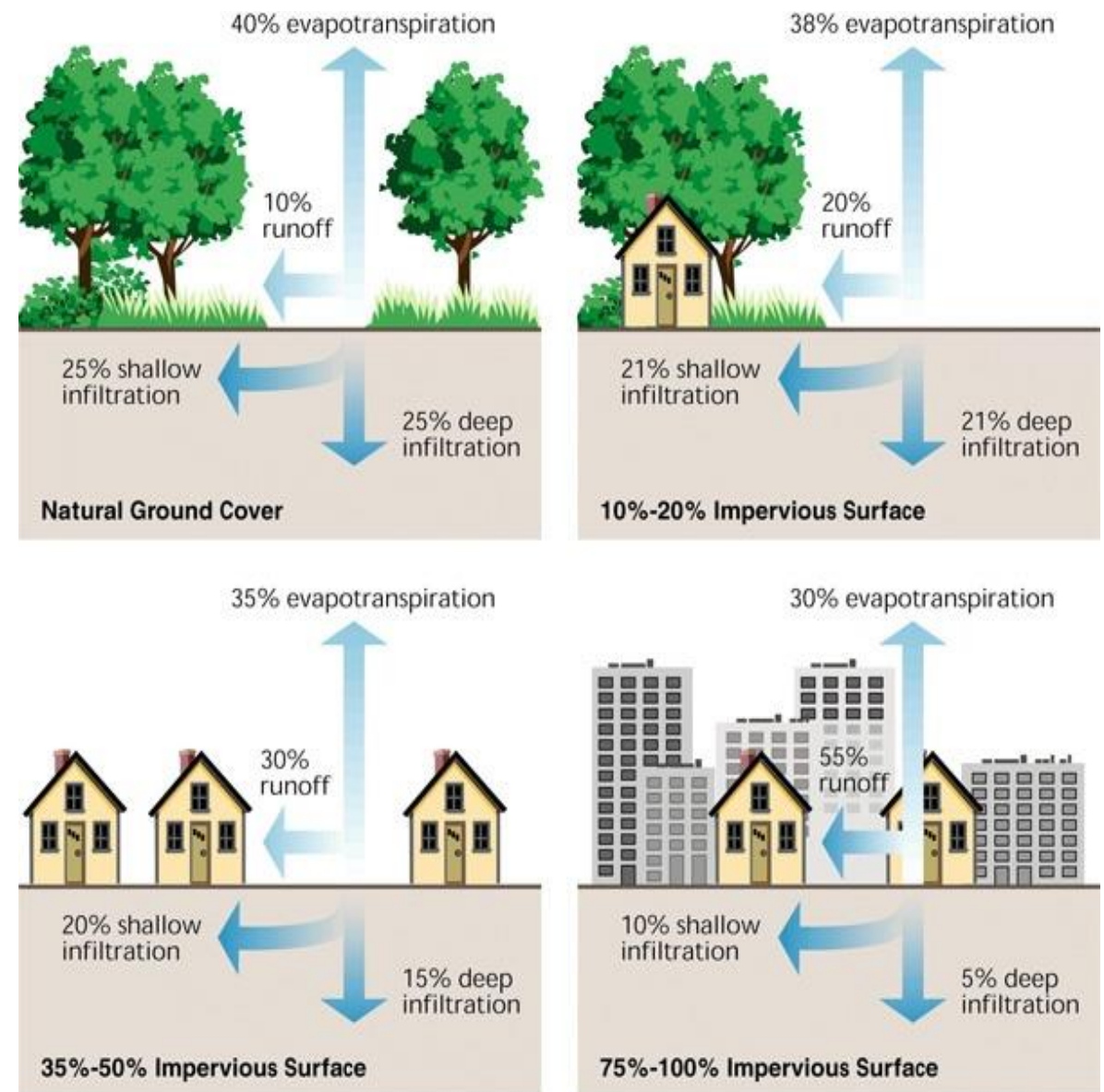
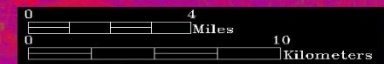
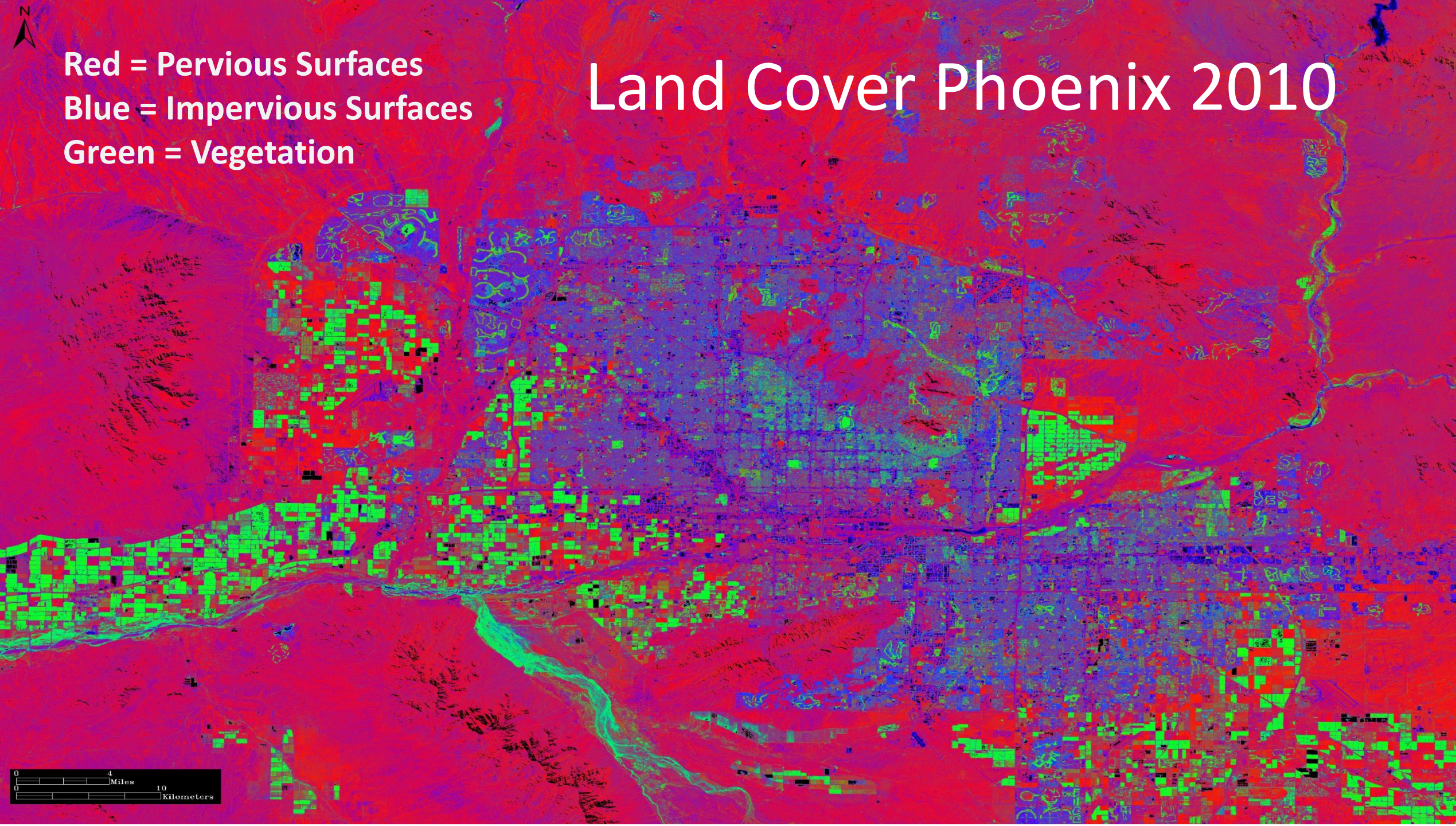


Fig. 3.21 -- Relationship between impervious cover and surface runoff. Impervious cover in a watershed results in increased surface runoff. As little as 10 percent impervious cover in a watershed can result in stream degradation.
 In Stream Corridor Restoration: Principles, Processes, and Practices (10/98).
 By the Federal Interagency Stream Restoration Working Group (FISRWG) (15 Federal agencies of the U.S.)



Red = Pervious Surfaces
Blue = Impervious Surfaces
Green = Vegetation

Land Cover Phoenix 2010





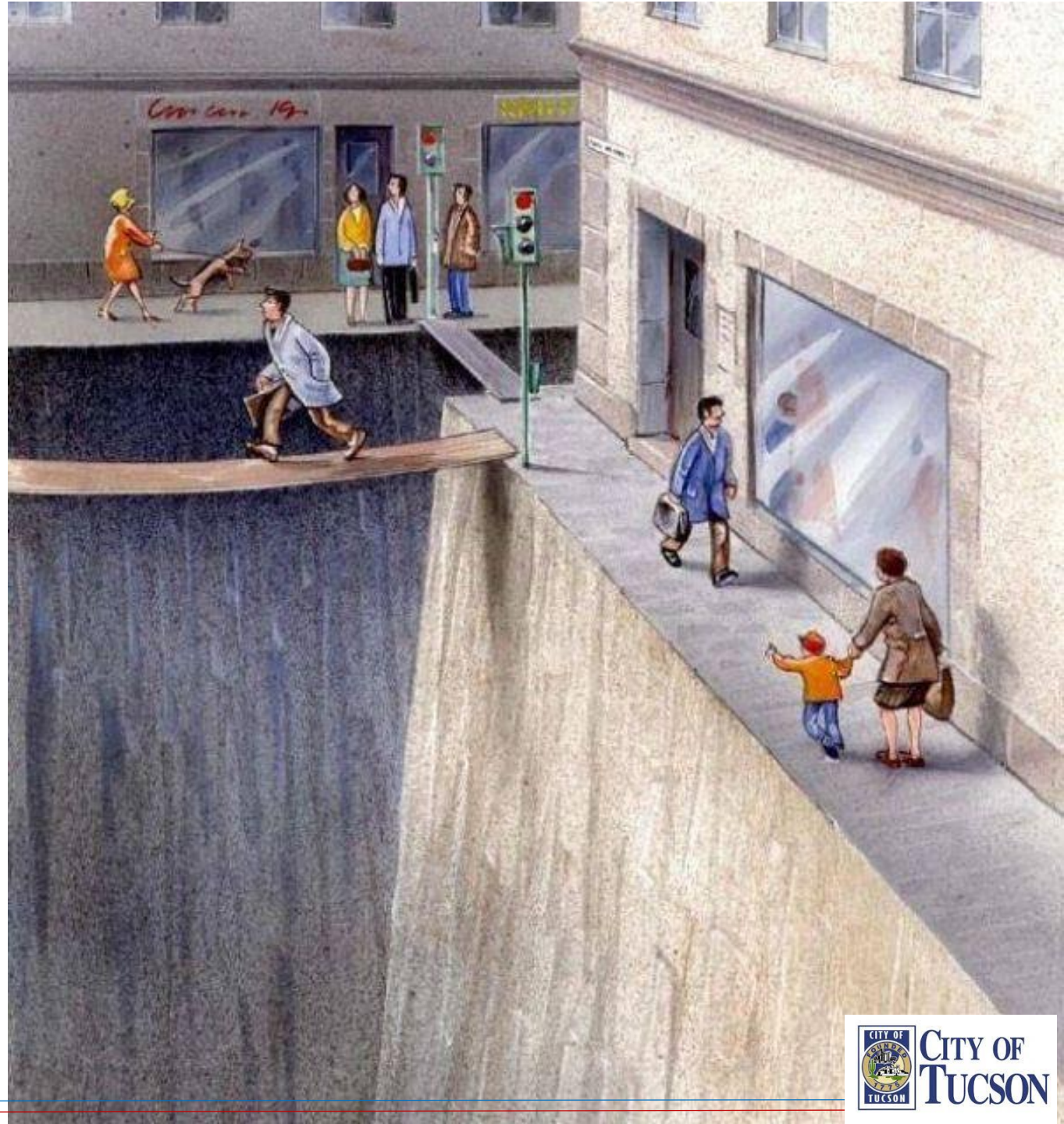
Tucson 1965



Tucson 2011

Economics of Asphalt

- **52%** of Arizona's roads are in poor or mediocre condition
- Tucson "has identified an **\$850** million backlog in street maintenance."
- Arizona's gas tax of **19** cents per gallon has not been increased in **22** years.
- Motor vehicle crashes cost Arizona \$4 billion per year (\$833 per person)



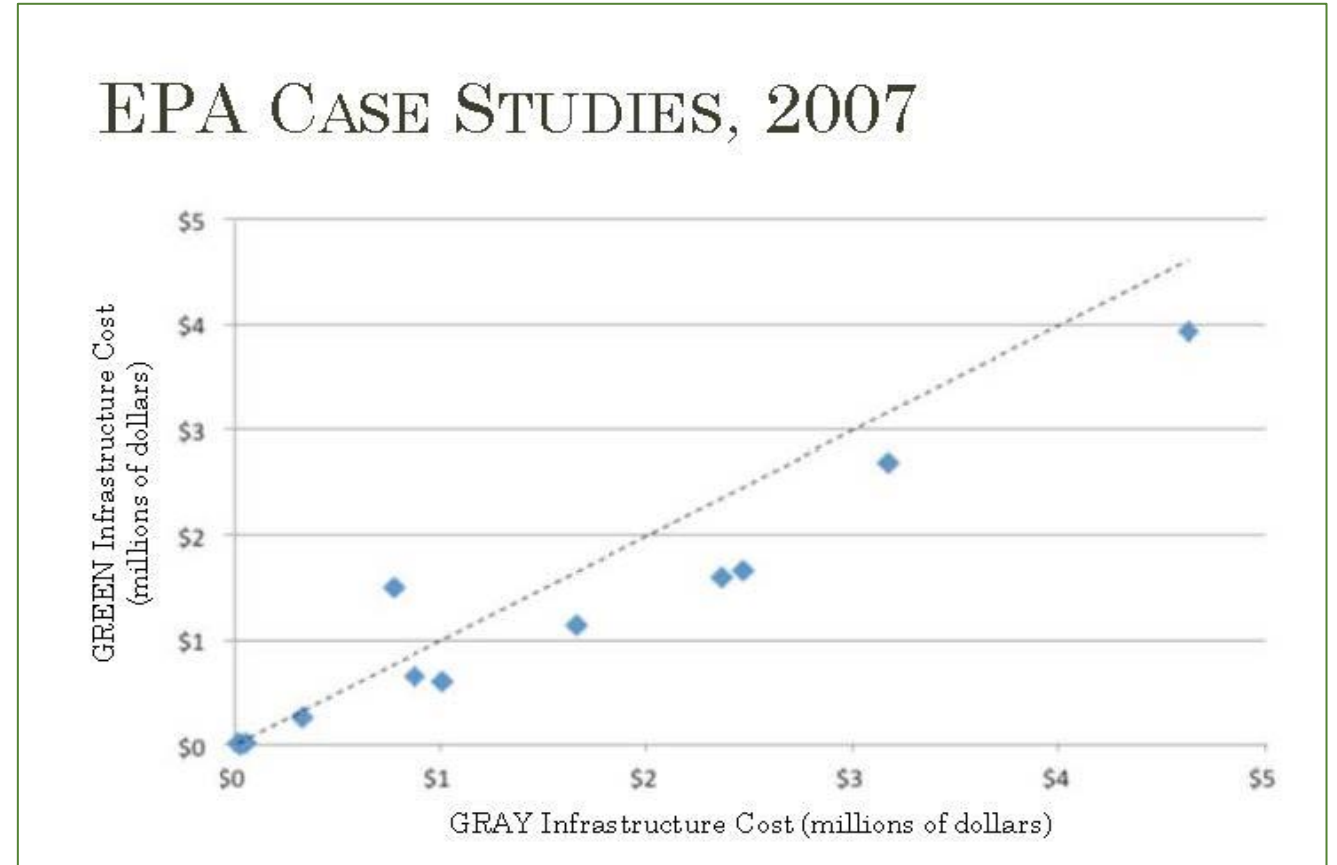
Economics of Water



- AZ needs **\$7.4 billion** in drinking water infrastructure in the next 20 years.
- AZ needs **\$5.2 billion** in wastewater infrastructure in the next 20 years
- Wells around Tucson are drying up
- “A number of costs associated with stormwater protection are not readily available” – City of Tucson

Financial Aspects of LID

- \$1 investment in urban forest can return \$2.23
- Shaded asphalt can last from 10-25 years longer
- Economies of scale – LID should actually get cheaper over time
- Few reports quantify the economic benefits that LID can provide



Tucson in Action

- Passed Green Streets Policy unanimously in May of 2013
- Tucson has raised water prices
- 50% rain harvesting requirement for commercial properties
- LID working group

Envision Rating System



**QUALITY
OF LIFE**

➔ Purpose, Community, Wellbeing



LEADERSHIP

➔ Collaboration, Management, Planning



**RESOURCE
ALLOCATION**

➔ Materials, Energy, Water



**NATURAL
WORLD**

➔ Siting, Land & Water, Biodiversity

The Business Case Evaluator (BCE)

Business Case Evaluator

A Value and Risk Based Enhancement to Envision™

Impact Infrastructure, LLC
INFORMING IMPACT INVESTMENTS

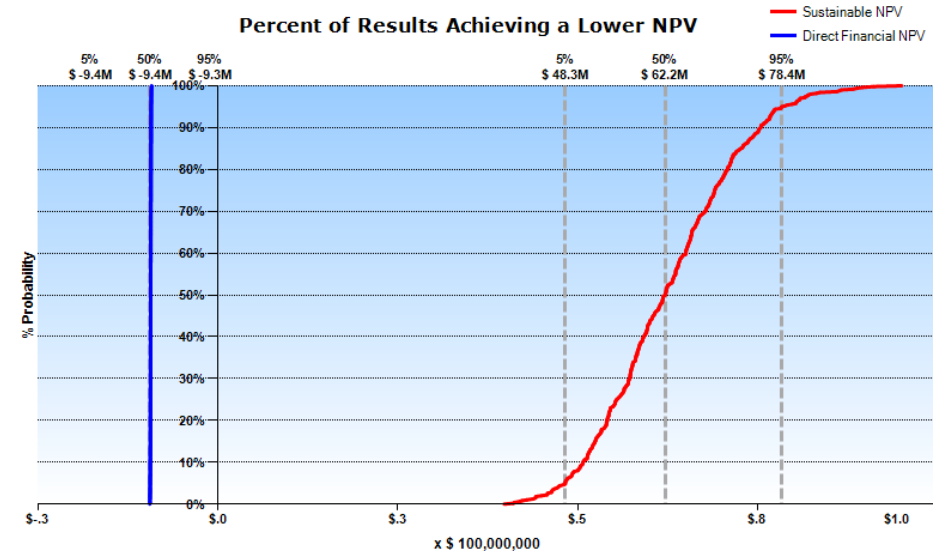
Run Business Case Analysis

Iterations: 500

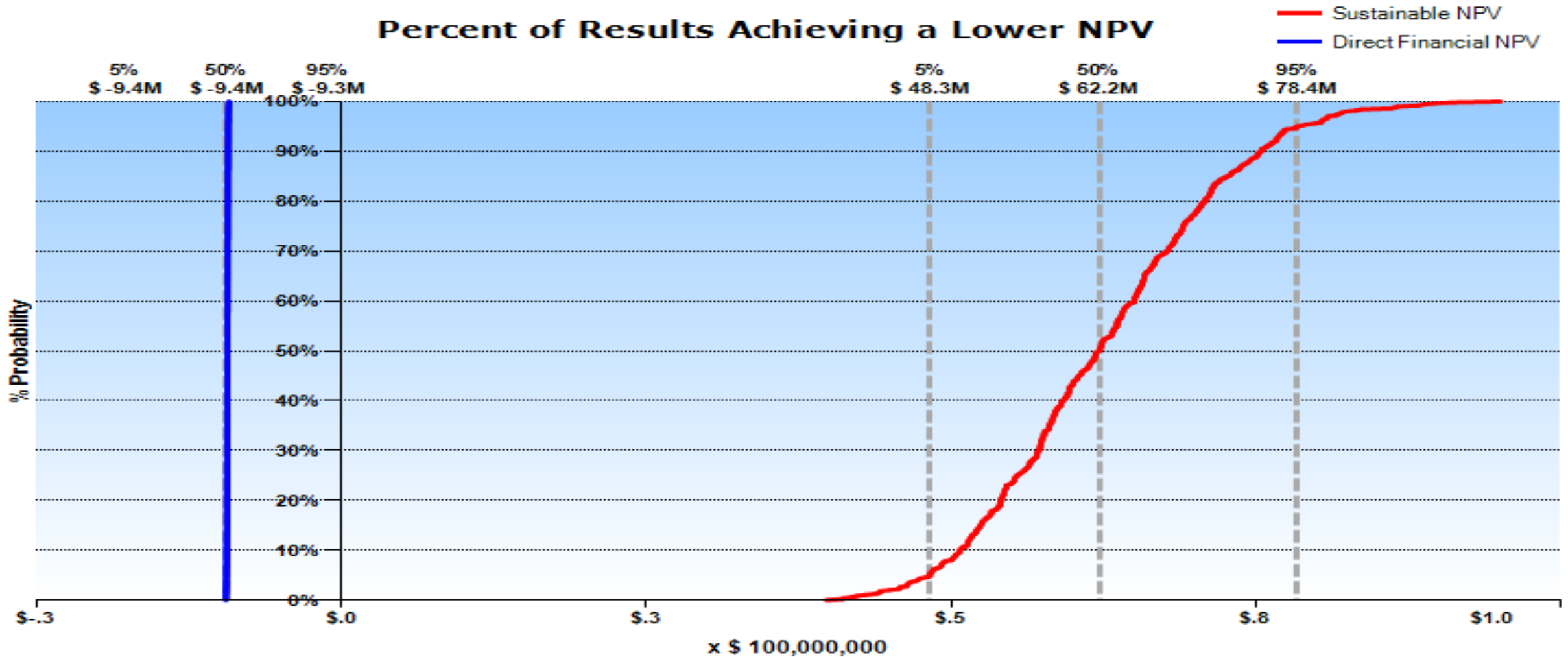
Start Monte Carlo Run

Save Monte Carlo Results

NPV	Breakeven (Years)	SROI	SIRR
Ave: \$62,581,416.95	3.49	2372.71%	72.31%
St Dev: \$9,601,424.95	0.00	331.87%	1.67%



Sustainable Net Present Value



The first curve is the Direct Financial NPV (only including Direct costs and benefits.

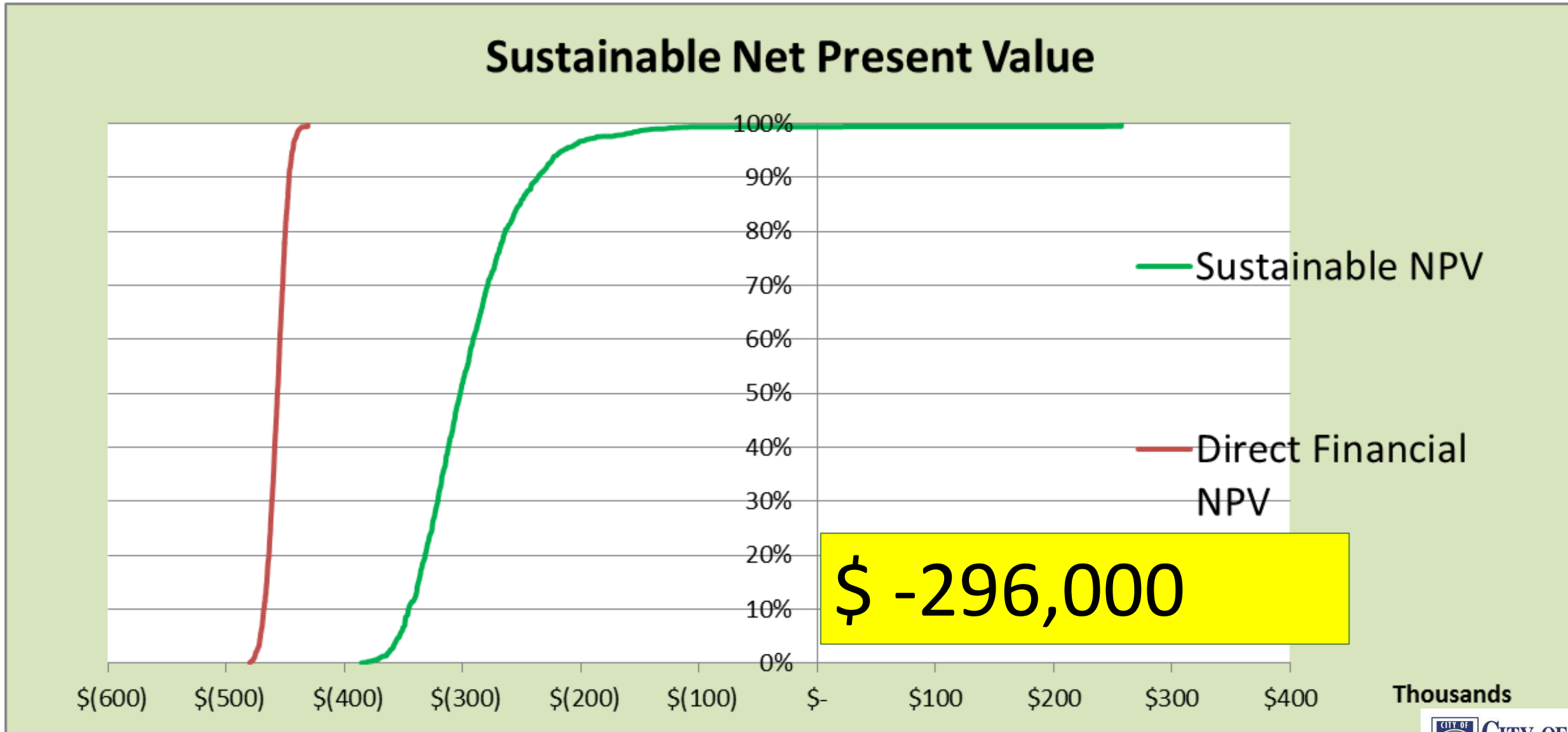
The second curve, (S-NPV) incorporates all costs and benefits, including economical, societal and environmental impacts.

Blue Moon Community Garden



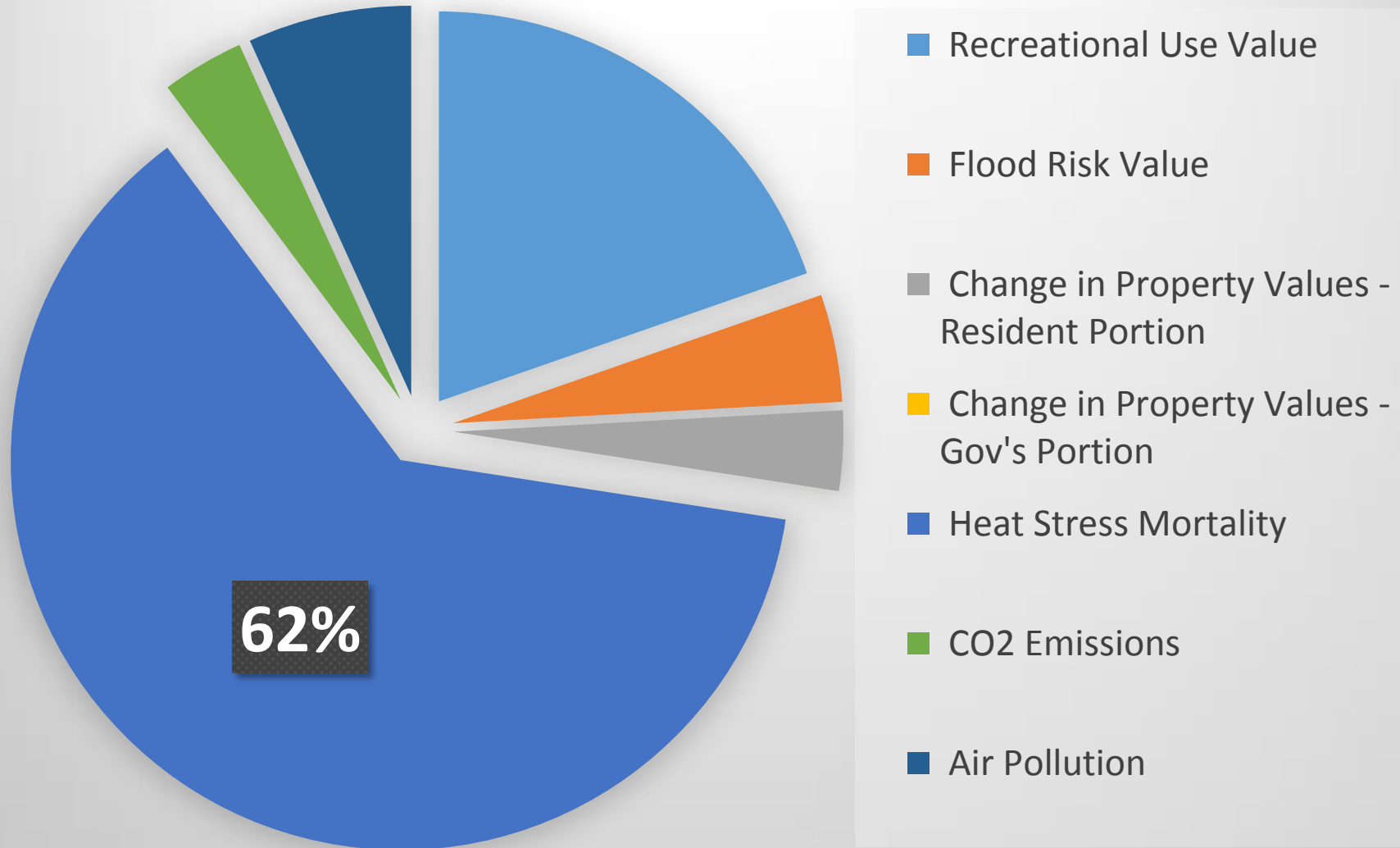
"Gardening is the highest art form. It uses all 5 senses."

Blue Moon Community Garden



Blue Moon Community Garden

Project Division of Benefits



Conclusions

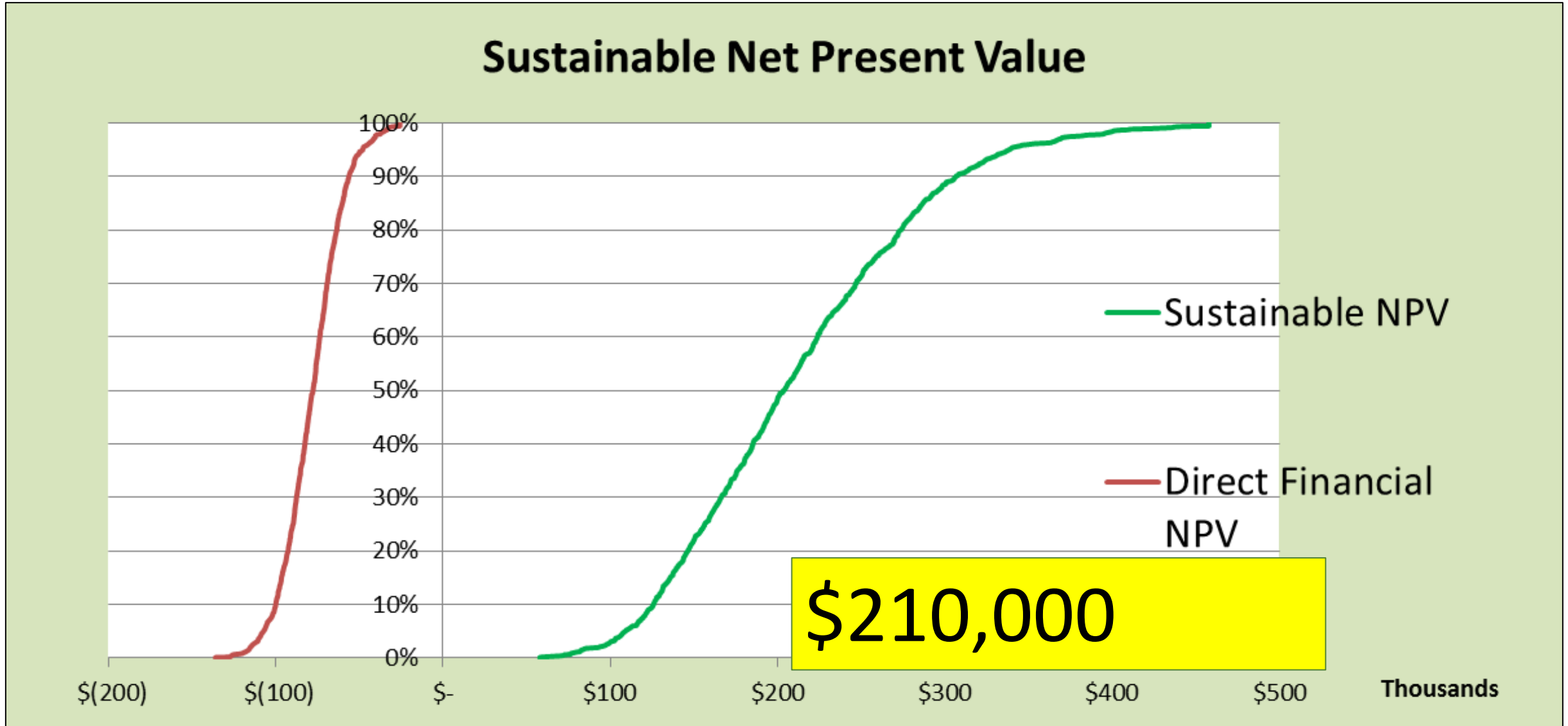
- BCE is progress and will be more valuable once automated and online (AutoCase)
- Social value is still not captured. Social return on investment or other measures need more acceptance and implementation
- Non-market valuations are still not a big part of decision making. Even economic benefits are not often counted
- More high-tech solutions have much longer paybacks and more maintenance concerns

Scott Avenue Revitalization

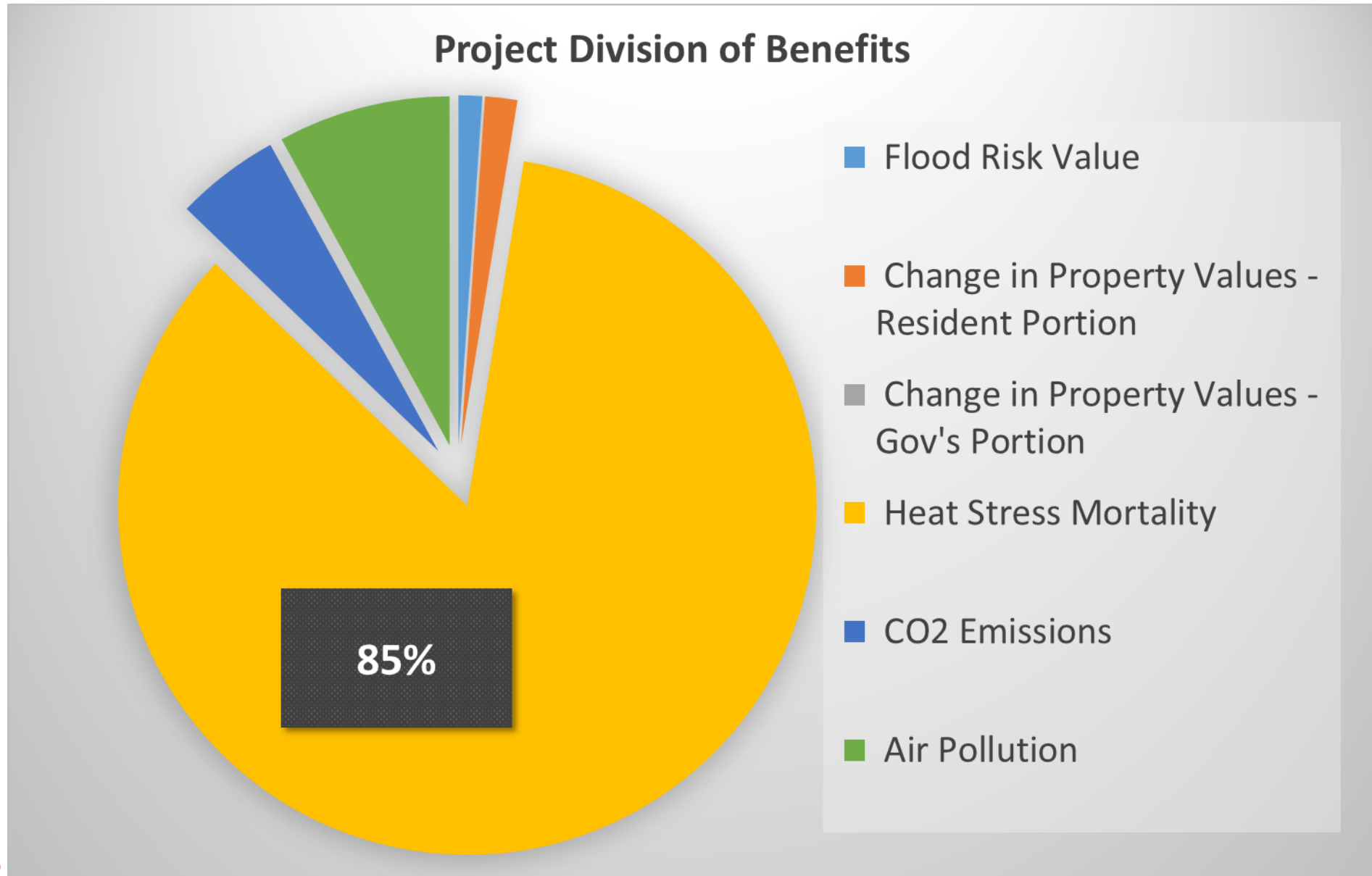


“What downtown could become”

Scott Avenue Revitalization



Scott Avenue Revitalization - Benefits



Conclusions

- Without comprehensive financial data, urban forest becomes the greatest economic benefit to residents
- Benefits like increased property values may be undervalued
- Need to know the true costs of conventional stormwater mgmt.

Recommendations

- Implement a life-cycle-costing project framework for Tucson
 - Hybrid approach that integrates S-ROI
- Start with standardized financial documents that capture project information up front. Use streamlined permitting in exchange.
- Work with upcoming AutoCase revisions to form an arid climate specific comparison calculator.
 - Convincing conventional vs. LID standards scenario tools are in high demand



Thank you