

- › Reducing in-home water use and loss to improve onsite sanitation system sizing in low-income, rural communities:
Insights from a pilot program in the Blackbelt, Alabama

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LIXIL

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› THE CHALLENGE: COMPLEX CHALLENGES REQUIRED INTEGRATED SOLUTIONS

ENVIRONMENT



Clay soils, low permeability High rainfall area.

SKILLED LABOR



Lack of skilled labor.

INFRASTRUCTURE



Rural area; limited centralized sanitation system coverage.

FUNDING / COST



Funding restrictions for sanitation systems.

BARRIERS TO INNOVATION



Innovation needed but pathways unclear

TRUST



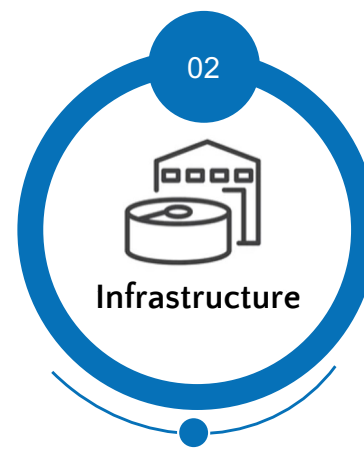
Lack of trust stemming from decades of environmental injustice.

› THE SOLUTION: WHY FOCUS ON WATER EFFICIENCY?

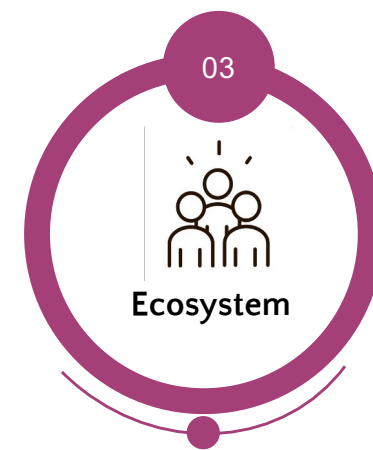
Water use efficiency provides immediate savings for households while driving long-term economic and sustainability benefits across the value chain



- Leads to lower water bills for households
- Prevents costly water damage
- Can reduce OSS Capex through efficiency gains and right sizing



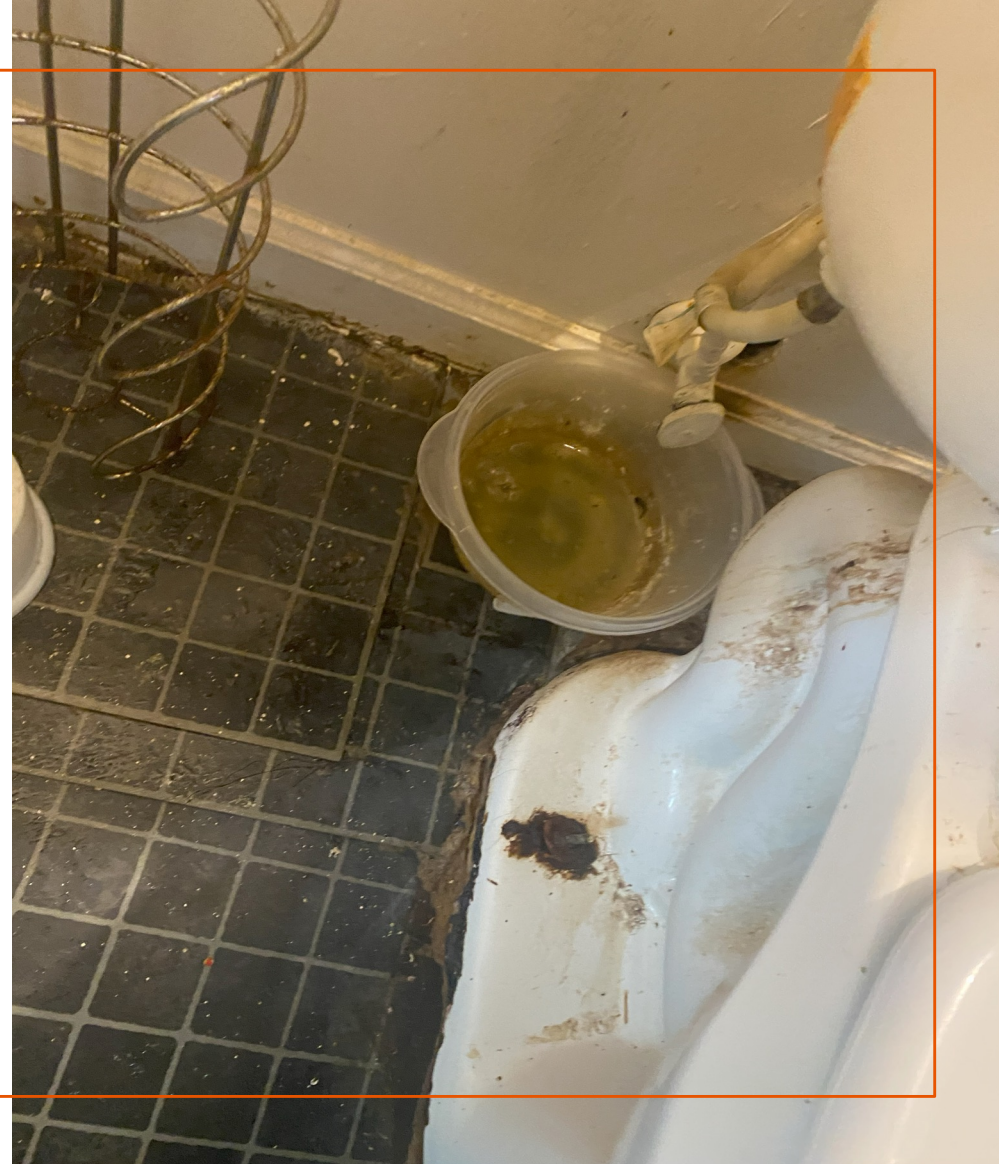
- Reduces, defers or even eliminates new water supply and new infrastructure investment
- Lowers maintenance costs and reduces strain on ageing infrastructure



- Improves water resource management and long term sustainability
- Reduces environmental impact

› THE SOLUTION: iPIP PROGRAM FEATURES

- Plumbing assessments and WE plumbing retrofits in **78 households**
- Turnkey, efficient management; 6 month delivery timeline from plumber recruiting to final retrofit
- **Plumbing upgrades used to incentivize household participation**
- **Hypothesized capital cost savings on OSS, enabled through variance granted on condition of WE retrofits**
- Training of local high school student through iVSH partnership, leveraged to provide continued workforce development opportunities
- Insights gathered and used to inform replicability and scale



› THE SOLUTION: PARTNERSHIP MODEL CRITICAL TO SUCCESS

A multi-year, multi-partner commitment to closing the sanitation access gap was critical to delivering improved access.

From contributor of water efficient fittings and fixtures to demonstrate a working model for 100 home pilot aimed at recruiting program participants and unlocking federal funding...



to implementation partner, delivering in-home water savings for cost effective onsite sanitation system roll out.

to solutions provider brokering partnership between BBUWP and ATU provider FujiClean and enabling design variance through water efficiency retrofits program design...



› DATA COLLECTION: MULTIPLE TOUCH POINTS AND METHODS

Household Survey

- Baseline and post-installation surveys delivered by community leaders
- Mix of multiple choice and open ended questions
- Qualitative and quantitative insights generated to define changes to behaviors and beliefs, economic impacts, satisfaction

Water Bill Analysis

- Intended installation of Droplet; prevented by limited wifi access
- Before and after water bill data from willing participants
- Program and household level water savings estimated using Alliance for Water Efficiency's Home Water Works Calculator

➤ **OUTCOMES: iPIP BY THE NUMBERS**

Program Basics

Project Duration:
July '24 – Jan '25

78 Households
Repaired

Plumbing Conditions

40% of toilets found
leaking

30% of toilet rated at
>1.6gpf

109 leaks identified
and repaired

Replacement Rates

62 new toilets (42%)

64 new bathroom
faucets (40%)

41 new kitchen faucets
(52%)

65 new showerheads
(57%)

Water Savings

5,800 gal/hh/year in
YR 1 and 3,800
gal/hh/year in
thereafter

452,400 gal/year in
year 1 and 294,400
gal/year in thereafter

Customer Satisfaction

100% happy with the
functionality and the
aesthetic of their
fixtures and valued
their money saving
potential.

100% gave the iPIP
plumber an 'excellent'
rating.

Program Cost /hh

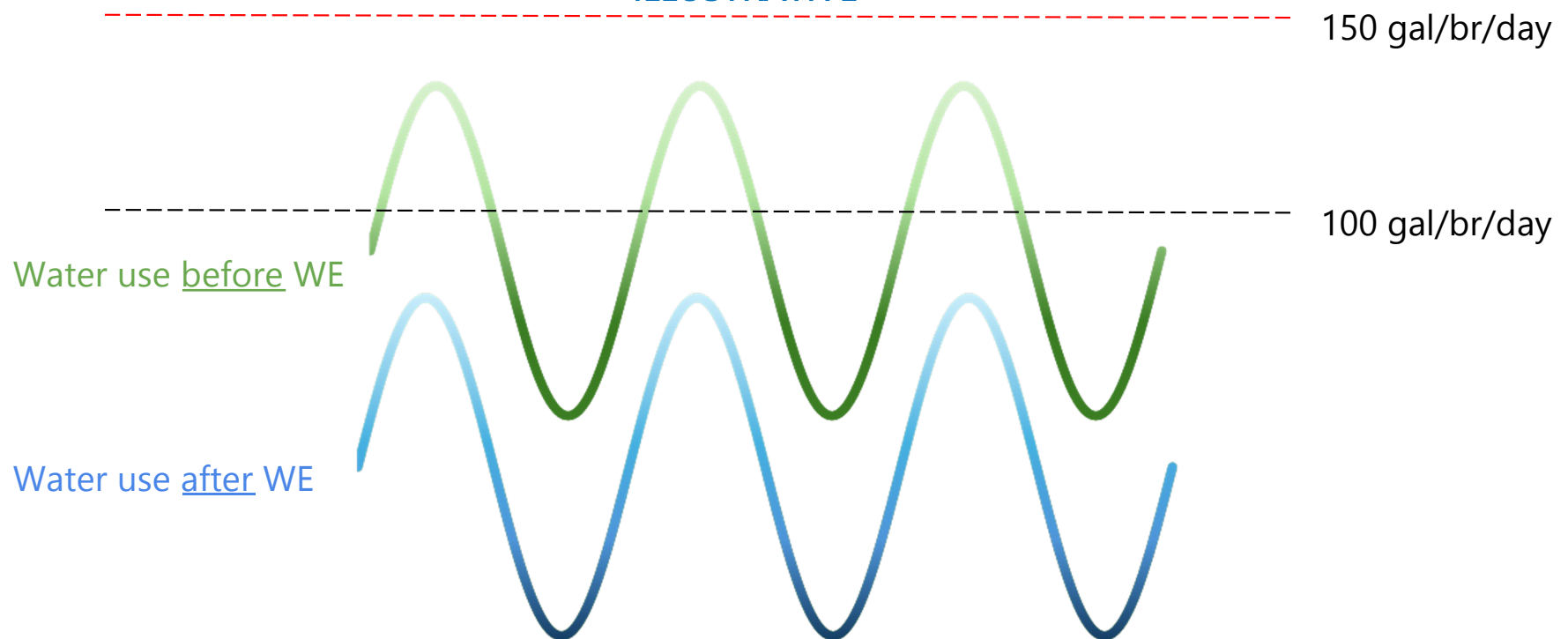
\$2000 / hh (Appx)

including: product,
recruitment, management,
warranties

➤ **OUTCOMES: WATER EFFICIENCY WAS CRITICAL TO MEETING THE SIZING VARIANCE**

Despite low baseline water use, **water efficiency was a necessary component** of meeting the obtained variance, de-risking overflow events for regulators.

ILLUSTRATIVE



➤ OUTCOMES: DIRECT ECONOMIC IMPACTS REALIZED BY MULTIPLE STAKEHOLDERS

Cost savings stretched program funds and reduced cost burden for homeowners

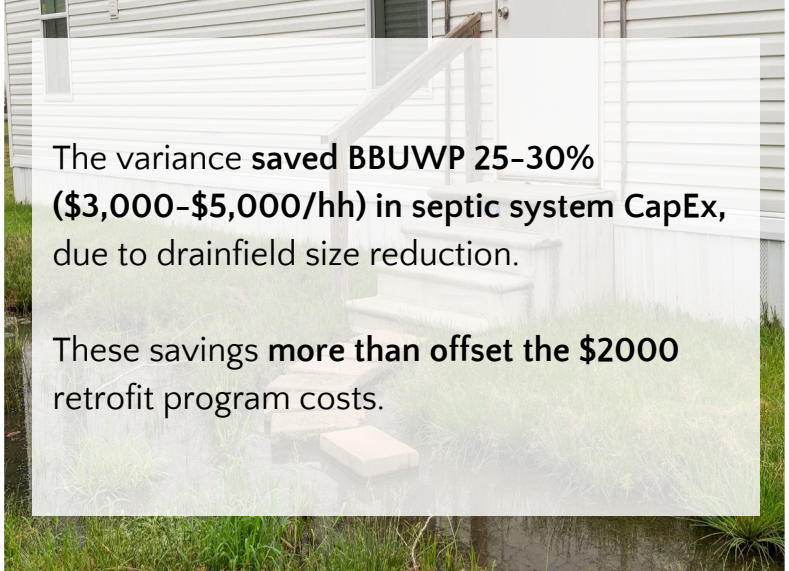
HOMEOWNERS



2/3 reported lower water bills equating to an estimated **\$8-10/month in savings**.

This **offset up to 50%** of the new sanitation maintenance fee, driving towards long term economic sustainability

PROGRAM



The variance saved **BBUWP 25-30%** (**\$3,000-\$5,000/hh**) in septic system CapEx, due to drainfield size reduction.

These savings **more than offset the \$2000** retrofit program costs.

> OUTCOMES: VOICES FROM THE COMMUNITY

“ I don't worry about sewage on the ground, my grandchildren can play in my backyard when they come over and we can enjoy outside events. ”

“ The plumbing is working well, no more leaks and I am thankful for everything. ”

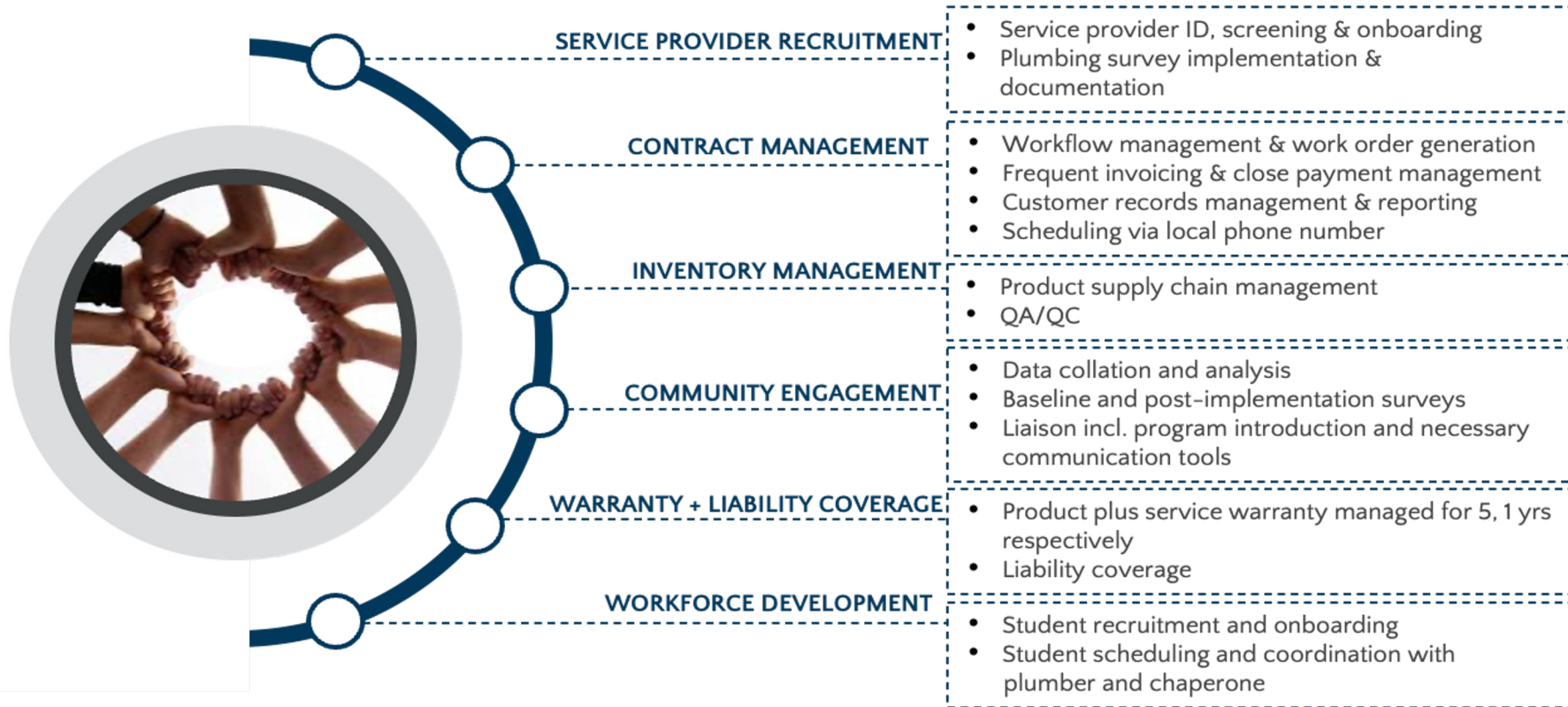
“ I have better efficiency toilets, faucets and don't have to worry about leaks. ”

“ [My] grandchildren don't have to worry about when to use the bathroom. ”

“ I notice that my [water] bill has dropped so if that's in regard to the system and the plumbing, that's great! ”

› THE OFFERING: A TURN KEY, COMPREHENSIVE SOLUTION

Managing complexity and adapting preemptively to community and client needs



KEY TAKEAWAYS

- 1 Onsite system design starts at the toilet; system optimization should consider factors inside and outside the home
- 2 Right sizing + water optimization saves money for program implementers and homeowners alike, accelerating uptake of new systems and providing new solution for difficult to serve lots and communities.
- 3 Low water usage alone is not sufficient to downsize treatment systems; water efficiency is critical to de-risking peak usage events
- 4 Private sector partners can deliver cost effective product +service models quickly and efficiently
- 5 Community engagement and partnership with local organizations is critical to project success

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