Emerald Ash Borer
Management Discussion

ARBORjet®
Revolutionary Plant Health Solutions

Chicago EAB Discovery & Management

2900 S. State Street

TREATED

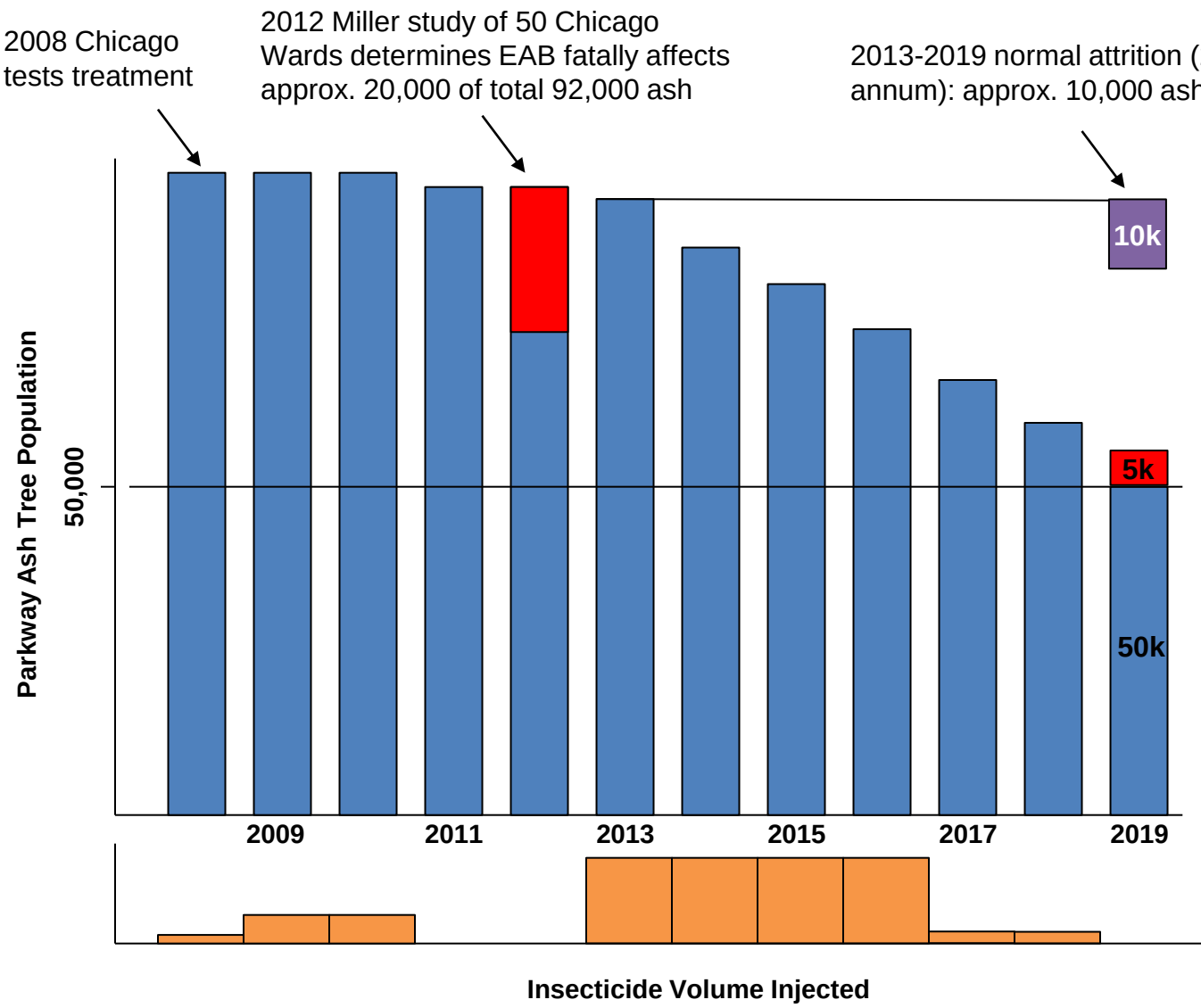
UNTREATED

Management Entity - Streets and Sanitation

- 93,000 Parkway Ash in 2008
- Largest urban Ash canopy in US
- EAB discovered August 2008
- Subsequent infestations citywide
- City crews began treatment in 2009
- Program ebbed in 2011
- Re-invigorated in 2013
- Ebbed again in 2016

Chicago Treatment Program Has Successfully Distributed Financial Risk

- 50%+ Ash (2009 baseline) are healthy/treatable
- $55 million spend has been deferred/partially subsumed
- Current two-year pause
- Treatment necessary to defer $50 million risk
  - Insect pressure in the region remains high
- Equipment readied for in-house treatment
- Chemical innovation makes treatment 35% faster
- Contractor pricing affordable



EAB has cost Chicago $56 million to date/$3.8m/year

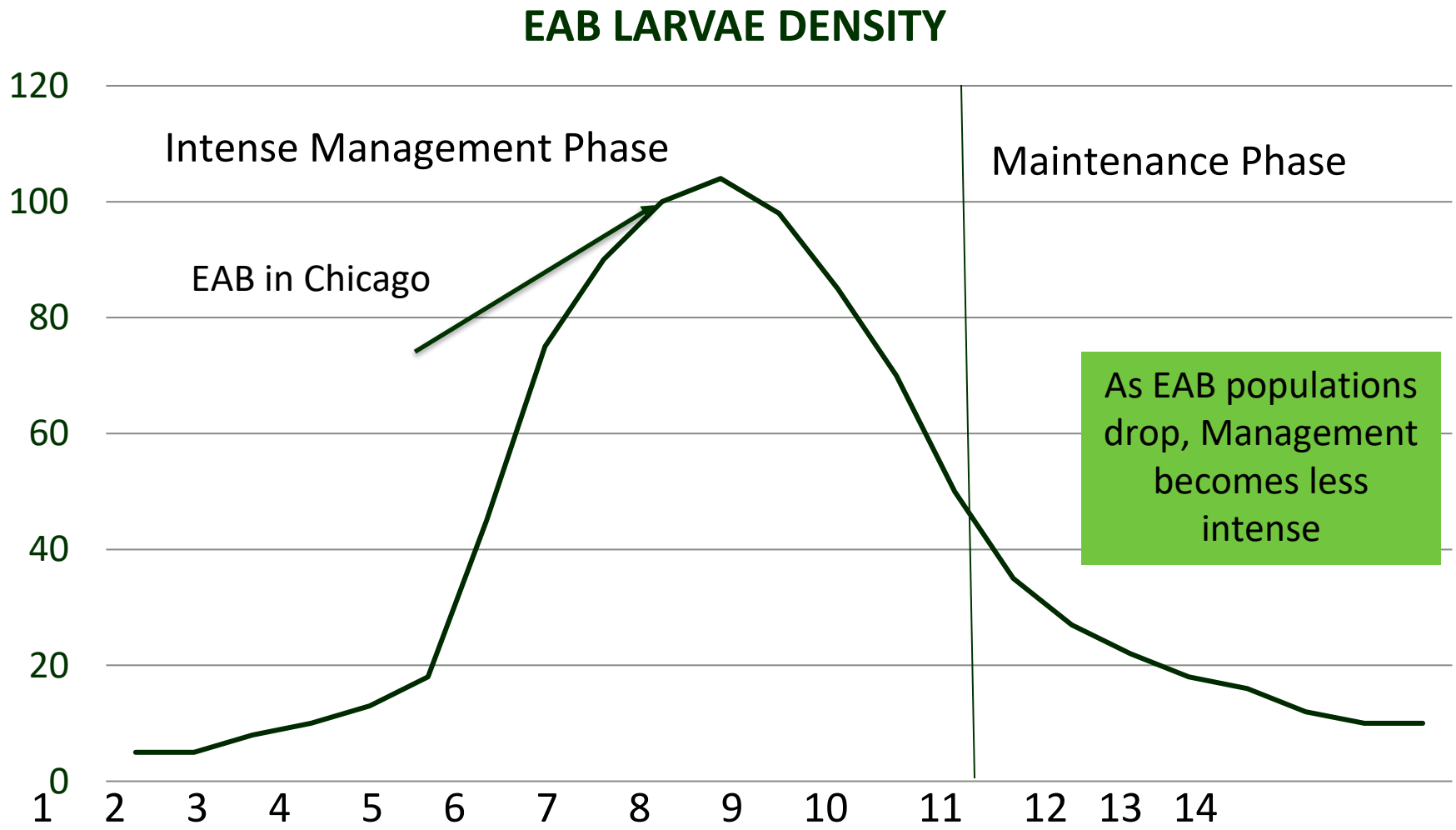
$37m to remove and replace

$ 9m to treat

$ 55m spend has been deferred to date

$ 5m of the $ 55m has been activated, will be incurred in the near term

Long Term Management for EAB

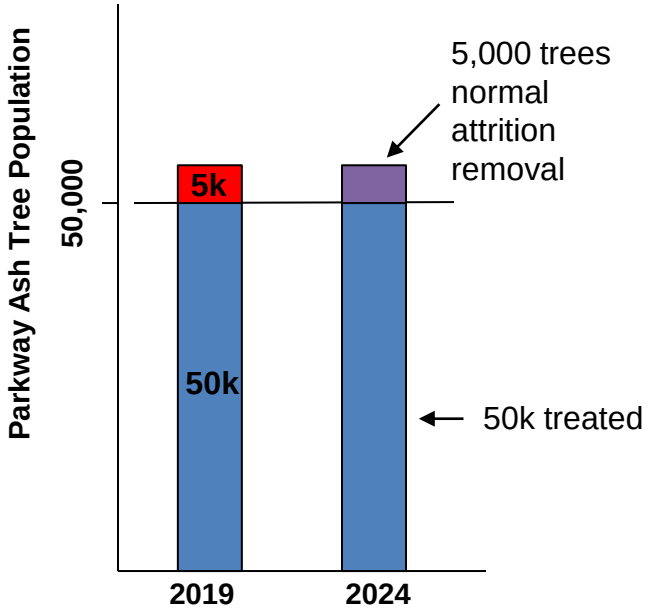


Moving Forward From ’18-‘19 Pause

- Cost to treat is $60 per in house vs. $100 contracted ($20/year and $33/year per tree respectively)
- EAB still at peak – Without treatment all dead
- Treatment labeled for 2 years and effective treatment interval is 3 years (forecast to expand)
- Cost of removal and replacement is $1,000 per tree
- 45,000-50,000 “treatable” ash remain
- 5,000 trees untreatable = $5 m near-term outlay

**** Streets and Sanitation report that in house treatments cost less than $60 per tree. Treatment lasts for 3 years. Cost of removal averages $1000 per tree***

Treatment Defers Risk / Allows Time To Cull Untreatable Within Budget



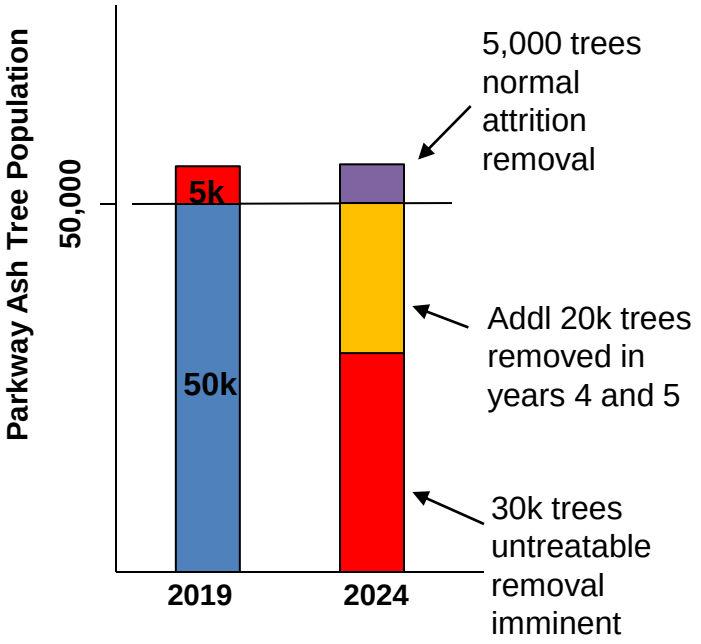
5-Year Treatment Scenario

$3m total/$.6 m avg. per year

Untreatable removed as part of normal attrition/normal budget

Chicago has managed EAB to a point that modest treatment and normal attrition are all that is required / mass removal can be avoided

Ending Treatment Pulls $50m Forward Increases Annual Spend 8X



5-Year No-Treatment Scenario

$20m remove and replace 2019 treatable

$4 m/year over 5 years

Years 6 and 7

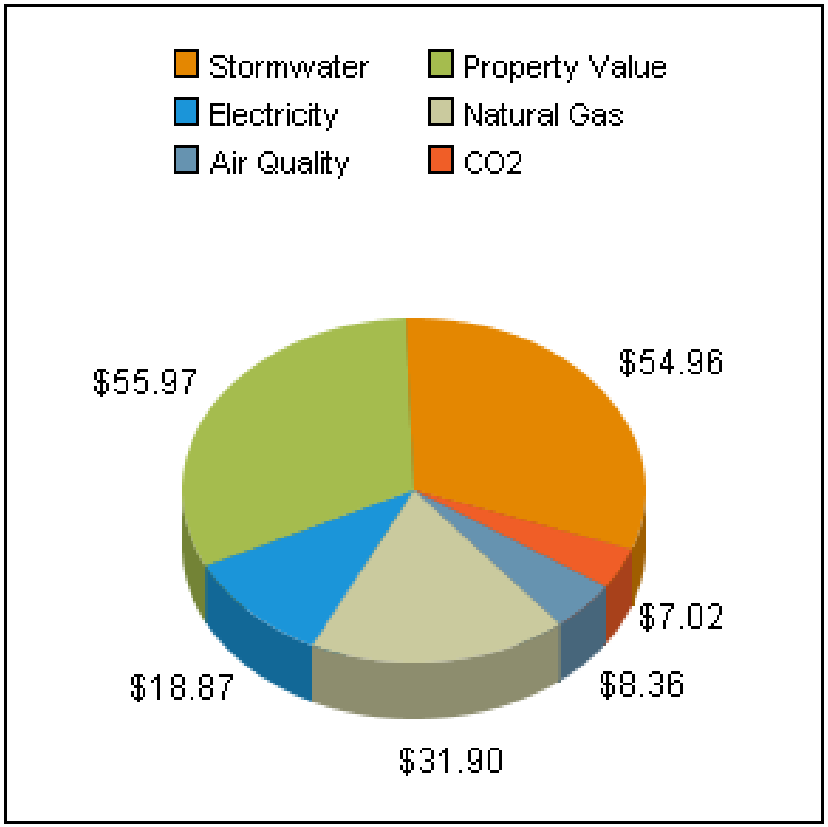
$ 30m remove and replace of 2019 treatable

$15m/year

$4.9m/year over 7 years

$.6m/year TREAT vs. **$4.9m/year END TREATMENT**

Trees as an Asset



A single 18" DBH Green Ash in Chicago may provide $160 in ANNUAL benefits to a property. 14,000 will provide millions in economic benefits.

Treebenefits.com

In House v Contracted

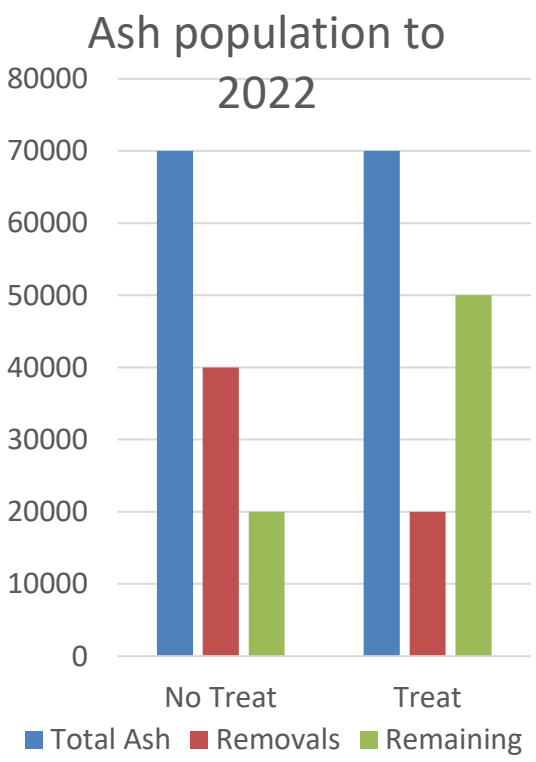
Streets and Sanitation dedicated

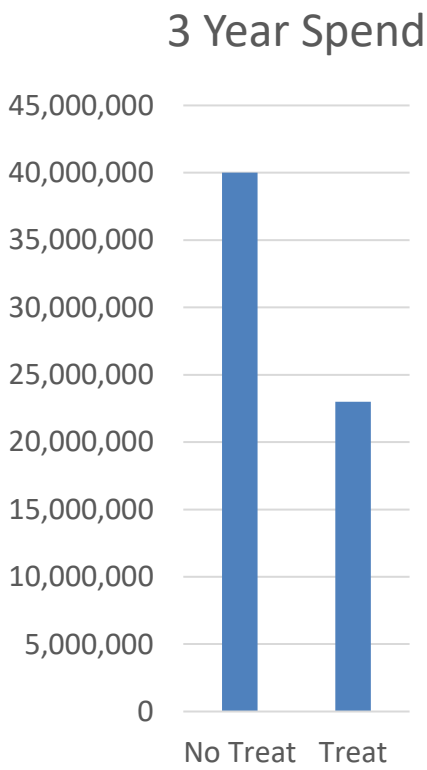
Employees treating May-Sept.

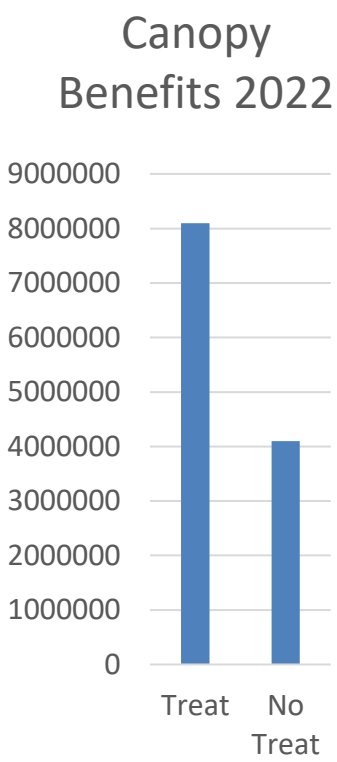
Equipment and materials contract in place. Manufacturer training on process and tree evaluations.

Experienced ISA Certified Arborists can evaluate and treat all ash in inventory. Labor contract using existing material contract to manage product utilization.

Three Year Scenario







Chicago's urban canopy

Healthy Ash trees on Montrose Avenue which can be protected for $20 per year **July, 2019**