VOP Ash Tree Removal/Replacement Program (ATRRP)
Board Report 10/7/2013

ATRRP Program at a Glance

Initial Seven (7) year tree removal/replacement program	2013 to 2019
Village-wide inventory of parkway trees	28,803
Inventory of ash trees (only) located in Village parks	*1,032*
*Number of ash trees in parkways based on *ARA study*	*8,085*
Estimated number of ash trees adjacent to ponds	*200*
Total number of ash trees inventoried prior to Removal/Replacement Program	9,317
Ash trees removed by end of 2013 *(number may vary slightly)*	2,402
Projected number of trees remaining after Dec. 2013	**6,915**
The following numbers assume 100% contractor participation with no staff tree removals	
Number of trees that can be removed/replaced annually based on funding ***(7-year program completion Dec. 2019)***	1,220 trees/$500,000
Number of trees to be removed/replaced annually for : (6-year program completion)/(additional funding needed)	(1,383 trees)/($567,030)
Total Cost to Remove/Replace Remaining 6,915 Ash Trees using current contract costs (7-year program)	$2,835,150
Total CIP Funds Identified through 2014 through 2019 ($500,000 annually)	$3,000,000
Current Contract Costs	
Average cost for contractor to remove, stump grind and *restore a single tree	$230 per tree
Contract cost to replace a single tree	$180 per tree
Total Contracted cost to remove and replace a single tree	$410 per tree
The following numbers assume Village tree removal participation in conjunction with contractor	
Number of trees that can be removed/replaced annually based on funding ***(6-year program completion Dec. 2018)***	1,463/$500,000
Total Cost to Remove/Replace Remaining Ash Trees using workload share of staff and contractor for a 6-year program	$2,389,830
Number of trees that can be removed/replaced annually based on funding *(5-year program completion Dec. 2017)/(additional funding needed)*	1,729/($70,788)
Number of trees that can be removed/replaced annually based on funding *(4-year program completion Dec. 2016)/(additional funding needed)*	2,305/(307,050)
Further Expedited Tree Removal/Replacement Option *(Staff and Contractor workload share)*	
Four year completion program using Village funds for tree *removal only*	$1,500,000
Using Illinois Finance Authority (IFA) Loan Program for "tree replacement" costs	$1,244,622
Total Cost of 4-year completion program *(cost does not include interest for loan)*	$2,744,622
Illinois Finance Authority (IFA) EAB Revolving Loan Fund *(Per the IFA, the EAB Revolving Loan Fund is dependent on the State's appropriation process and has yet to be funded as of 9/30/13)*	-Zero to Low Interest -Up to $5M for 20 years -5% of principal, or 5% of remaining balance

**Applied Research Associates (ARA) was hired to perform a pavement condition survey, also inventoried roadway signs, street lights, pavement markings, sidewalks, crosswalks and parkway trees (Board Approval: Feb. 6, 2012)*
**Restoration process does not include tree replacement. Restoration simply backfills area where tree was removed*

Introduction and Background

The Emerald Ash Borer beetle (EAB) is an invasive, non-native insect that feeds on and ultimately causes the demise of Ash trees. The beetle is metallic green in color and approximately one half (1/2) inches in length. The EAB was first discovered in the United States in Michigan in 2002 and is believed to have been transported to the United States from Asia via shipping crates.

Until recently, the EAB was without a known natural enemy, which facilitated the widespread destruction of ash trees nation-wide. The beetle has destroyed tens of millions of ash trees in southeastern Michigan alone, with tens of millions more lost in Connecticut, Illinois, Indiana, Iowa, Kansas, Kentucky, Massachusetts, Maryland, Minnesota, Missouri, New Hampshire, New York, North Carolina, Ohio, Ontario, Pennsylvania, Tennessee, Quebec, Virginia, West Virginia and Wisconsin.

Regional Issue

EAB has resulted in millions of dollars being spent for tree removal, preventative treatments and disposal by municipalities, property owners, nursery operators and forest products industries. The EAB is now a regional and local issue. According to the Illinois Department of Agriculture, the Emerald Ash Borer was confirmed in the Village of Orland Park, Illinois, on July 27, 2010 (10 IDA EM-066). Small and large communities across the north, south and west suburbs of Chicago are taking action to mitigate EAB devastation. In many cases, municipalities having varying degrees of budget concerns are opting for the removal and replacement of entire ash tree inventories. From Toledo, Ohio, to Lake Forest, Illinois, and Tinley Park , Illinois, removing all or a substantial portion of municipal ash tree inventories appear to be the most cost effective and permanent solutions for eradicating the EAB.

Policy Implementation/Board Action

In 2012 the Village formalized its initial EAB efforts with the policy decision to remove and replace all ash trees. The Village engaged two separate contractors. GroundsKeeper Landscape Care, LLC was contracted to perform ash tree removal/stumping and surface restoration, while Mid-America Tree and Landscape was contracted to implement the Village's one-for-one tree replacement program. In most cases, when an ash is removed, a replacement tree will be planted in its place. There may be some areas where a one-to-one replacement is not possible due to underground infrastructure concerns. Because of the sheer number of ash trees, three entities are engaged in the removal of ash trees: Parks & Building Maintenance, Public Works Street Division and contractor, GroundsKeeper Landscape LLC.

Village of Orland Park Ash Tree Inventory

Recent tree surveys were performed by both Applied Research Associates (consultants) and Village staff arborists.

- 28,803 trees in its overall tree inventory.
    - Of the 28,803 trees, 9,317, (32%) are ash trees; in comparison, Tinley Park has 9,000 ash trees
    - Of the 9,317 ash trees, 8,085 are located in parkways
    - 1,032 are in parks and on municipally owned property
    - 200 are immediately adjacent to ponds (approximation)

Contract Information

- Contract with Groundskeeper Landscape Care LLC ends in December of 2016.
  - Average cost to remove a tree per Groundskeeper contract is around $230.
- Mid-America Tree and Landscape contract ends in December of 2013.
  - Current cost for tree replacement is $170 per tree (Mid-America Landscaping).
- The total average cost for individual tree removal and replacement is approximately $410.
- Excellent contract price: similarly sized municipal tree removal projects ranging from $415 to $1,200 per tree.

Removal Challenges and Concerns

A major concern that communities have when dealing with EAB tree removal is the limited speed at which a tree removal program can be completed due to various funding limitations. Municipal budgets can only accommodate the removal/replacement of a limited number of trees during the fiscal year. Meanwhile, the remaining inventory of trees is left to continual and rapid decline. While trees scheduled for years one and two are removed before they reach a point of deterioration, trees scheduled and budgeted for removal in the 4th, 5th and 6th years can become a danger to people and property. Even with prioritizing the removal of large diameter trees, the Village's expansive inventory of relatively smaller trees, when left to the EAB for two or three years, will die and become brittle posing a danger to the communities where they once added value.

Budget, Cost and Completion Year

Prior to 2013, the Village allocated $100,000 every year for the purposes of cutting and trimming trees. With the arrival of the EAB, the Village now budgets $500,000 per year in its capital improvement program (CIP) for the ash tree removal/replacement program. This seven (7) year program is scheduled to be funded from FY 2013 through FY 2019. To date, nearly 2,000 trees have been removed. Approximately 365 new trees have been planted. This is due to the seasonal lag of trees only being able to be planted in the spring and fall. The Village anticipates that approximately, 2,402 trees will be removed by the end of December 2013, leaving roughly 6,915 trees to be removed and replaced.

7-Year Removal/Replacement Plan *(100% Contractor)*

All charts assume FY 2013 as the first year of the removal/replacement program. The seven (7) year program schedule details a seven year ash tree removal completion program based on a budget allocation of $500,000 per year. This chart also makes the assumption that 100% of the removal program is performed by the contractor. Staying within the $500k budget, the Village could remove and replace approximately 1,220 trees every year to complete the project by 2019. The 2019 budget could be reduced to $355,000 with 817 trees needing to be removed and replaced in that final year.

Unfortunately, the seven (7) year program provides more time for ash trees that are already in a rapid decline to worsen. The sheer volume of the Village's ash tree inventory, as it relates to EAB, requires a level of heightened attention as thousands of trees that are scheduled for later year removal will become hazards well before their removal phases. Also, once trees become visibly degraded, citizens will contact the Village Hall and Public Works Department requesting immediate removal. Public Works staff will then evaluate the condition and prioritize the removal based on the existing extensive list.

Alternative Program Schedules

Each of the following groups of schedules show two possible scenarios. The first scenario shows what a potential ash tree removal/replacement schedule would look like as it relates to its length (i.e., 6-year program, or 5-year program), its cost based on the current budgeted amount, and the workload participation between staff and contractor. Staff has added a noticeable value to the Village's tree removal/replacement program. Currently, the program has been shortened by 1-year from completion in December 2019 to completion in December 2018. The ash tree removal/replacement program could be handled 100% by the contractor, but the program would extend to 2019, creating various dead tree hazards in the community. Staff's participation at 600 tree removals per year shortens the program schedule and reduces the overall funding needed from the capital improvement plan.

7-Year Program Scheduled (100% Contractor)

- 6,915 ash trees remain for removal/replacement for a current contract cost of approximately $2,835,150
- At a current funding level of $500,000 per year, Village will complete the project in seven (7) years (2019)
- $334,150 program cost reduction compared to 7-Year Program

6-Year Program Schedule (100% Contractor)

- The 6 year program schedule can be accomplished with an annual budget increase of $67,030
- While not ideal, decreasing the program from 7 years is a step forward in shortening the overall program schedule

Current 6-Year Program Schedule (Staff and Contractor Workload Sharing)

- Village staff to supplement tree removal/replacement program by removing 600 trees per year
- 6,915 remaining ash trees removed and replaced for a cost of $2,389,830
    - $444,320 savings from 7-year program
    - $444,320 savings from the 6-year 100% contractor scenario
- Current funding level of $500,000 per year, Village will complete project in six (6) years (2018)

5-Year Program Schedule (Staff and Contractor Workload Sharing)

- Utilizing Village staff at 600 trees per year would require an additional budget increase of roughly $70,788 per year
    - $572,930 annual budget versus the $500,000 current budget
    - $2,283,150 program total

4-Year Program Schedule (Staff and Contractor Workload Sharing)

- Utilizing Village staff at 600 trees per year would require an additional budget increase of roughly $307,050 per year
    - $807,050 annual budget
    - $2,421,150 program total

Illinois Finance Authority (Emerald Ash Borer Revolving Loan Fund)

The Illinois Finance Authority (IFA) has been given the authority to administer an emerald ash borer revolving loan program. The program shall provide low-interest or zero-interest loans to units of local government for the treatment of standing trees and replanting of trees on public lands that are within emerald ash borer quarantine areas as established by the Illinois Department of Agriculture. The Village of Orland Park is included in the Cook County and Will County EAB quarantine areas.

Per legislation, the IFA may make loans based on the recommendation of the Department of Agriculture. The loan funds, subject to appropriation, must be paid out of the Emerald Ash Borer Revolving Loan Fund, a special fund created in the State treasury. Moneys in the Fund may be used only for loans to units of local government for the treatment of standing trees and replanting of trees within emerald ash borer quarantine areas established by the Department of Agriculture and for no other purpose.

A loan may not exceed $5,000,000 to any one unit of local government. The repayment period for the loan may not exceed 20 years. The unit of local government shall repay each year, at least 5% of the principal amount borrowed or the remaining balance of the loan, whichever is less. According to the Chicago office of the Illinois Finance Authority, the IFA Revolving Loan Program is currently an unfunded mandate and subject to State appropriation. Once implemented and funded, the revolving loan program could be implemented in the following scenario.

IFA 5-Year Scenario (100% Contractor)

Assuming that the contractor would handle 100% of the work, Village funding would be exclusively used for the removal of ash trees. No funding would be used to replace the trees once removed. The Village could make application to the IFA for a loan ($391k per year) ($1.2M program length) that would cover the cost of tree replacement. If successful, this IFA option would reduce the program to 5-years with only 393 tree left to remove in year 5 (2017). The IFA revolving loan fund could be an option to complete the removal/replacement program by December of 2017.

IFA 4-Year Scenario (Staff and Contractor Work Load Sharing)

Assuming that staff continues work load sharing for the ash tree removal/replacement program, the Village could complete its ash tree removal/replacement program in 4 years utilizing the IFA revolving loan program. The cost for -tree removal only- is $1,245,410. The cost to replace the trees would be covered by the IFA loan at $1,244,669, for a total cost to the Village of $2,490,079. This total does not include interest costs.

The IFA loan scenarios allow the Village to shorten the overall ash tree removal program. Utilizing staff to supplement the tree removal program has shortened the initial program from seven (7) years to six (6) years. Even with a shortened six year program, trees scheduled to be removed in years 4, 5 and 6 still present a potential threat to neighborhoods. Short of adding additional funding to the Village's ash tree removal/replacement program, there are few options with regard to shortening the overall program. With such a large volume of trees a phased program is inevitable; the only identifiable goals are to find supplemental funding in the form of grants and loans, and/or ways to increase the program's existing budget.

Staff and Contractor Work Load Sharing

Illinois Financing Revolving Loan for Tree Replacement

- Using loan funding to cover the cost of replanting only, the Village's total program cost would be approximately $2,490,079
  - $,1,1,245,410 for tree removal (staff and contractor workload share)
  - $1,244,669 loan
- 6,915 remaining ash trees would be removed by December of 2016 (a four year program schedule)

EAB Removal/Replacement Schedules and Completion Year Options

EAB Ash Tree Removal/Replacement Schedule Summary	7 Year (100% Contractor)	6 Year Staff & Contractor 2018 Completion	5 Year Staff & Contractor 2017 Completion	4 Year Staff & Contractor 2016 Completion
Annual Budgets	$500,000	$500,000	$572,000	$807,050
Total Program Cost	**$2,835,150**	**$2,260,310**	**$2,283,000**	**$2,421,150**
VOP Annual Tree Removal	0	600	600	600
Contractor Annual Tree Removal	1,220	956	1,132	1,705
Trees Planted Annually	1,220	1,556	1,732	2,305

Illinois Finance Authority (IFA) Revolving Loan Program

EAB Ash Tree Removal/Replacement	***4 Year Plan***
Annual Budget	$500,000
Total Program Cost (Removal Only)	$1,245,410
Contractor's Annual Tree Removal Costs	$500,000
Total Cost to Replace Trees (IFA Loan)	$1,244,669
***Total Program Cost**	**$2,490,079**

**Total Program Cost does not include interest*

Expedited 4 Year Completion Schedule Detail

100% Contractor **4 Year Removal/Replacement Programs**

4 Year Program Schedule	FY 2014	FY 2015	FY 2016	Totals
Initial Annual Budget for removal/replacement program	$500,000	$500,000	$500,000	$1,500,000
Trees needed to be removed/replaced per a 5 year schedule	2,305	2,305	2,305	6,915
Contractor Cost to Remove/Replace Trees	$945,050	$945,050	$945,050	**$2,835,150**
Running Count of trees remaining per year	4,610	2,305	0	**0**
Annual Budget **Increase** Required for 5 Year Program	**$445,050**	**$445,050**	**$445,050**	**$1,335,150**

Staff and Contractor Work Load Sharing **4 Year Removal/Replacement Program**

4 Year Program Schedule	FY 2014	FY 2015	FY 2016	Totals
Initial Annual Budget for removal/replacement program	$500,000	$500,000	$500,000	$1,500,000
Trees Removed by Village Staff	600	600	600	1,800
Replacement Cost for Staff removed trees	$108,000	$108,000	$108,000	$324,000
Trees Remaining to be Removed by Contractor	1,705	1,705	1,705	5,115
Contractor Cost to Remove/Replace Remaining Trees	$699,050	$699,050	$699,050	$2,097,150
Total Number of Trees Removed/Replaced	2,305	2,305	2,305	6,915
Running Count of trees remaining per year	4,610	2,305	0	0
TOTAL Cost to Remove/Replace Trees for 4 Year Program	$807,050	$807,050	$807,050	**$2,421,150**
Annual Budget **Increase** Required for 4 Year Schedule	$307,050	$307,050	$307,050	$921,150

Best Practices Proactive Removal and Reactive Removal Pros and Cons

Once infested with EAB, ash trees typically begin declining over a period of 2-3 years. The burden of dealing with hundreds or thousands of dead and dying trees in a short period of time can place an enormous strain on community budgets, personnel and resources. Having a relatively large inventory of ash trees, the Village uses its staff to augment our contractor's tree removal/replacement efforts. The Village has been successful in aggressively reducing the overall ash tree inventory using both a proactive and reactive removal strategy. The following recommendations are based on best practice compilations and EAB management plans from various communities and state agricultural agencies.

Proactive Removal - Removing ash trees regardless of condition or health.

Pros:

- Opportunity to spread removal costs over a longer time frame
- Reduces problem of dealing with many dead &/or hazardous ash trees at one time
- Opportunity to start the replanting/recovery process immediately
- Greater flexibility in organizing removal and routine work schedules
- Establishes a definitive grasp of the overall problem

Cons:

- Immediate impacts to tree canopy and aesthetics
- Does not take into account that research may find an effective control for EAB

Reactive Removal - Removing ash trees which are either infested with EAB or dead

Pros:

- No negative public perception of removing healthy trees.
- Further EAB research may offer effective control, minimizing need for removals.

Cons:

- Budget impacts can be severe once EAB is in community.
- Replanting funds may not be available due to extreme removal costs.

Tree Removal Categorization (Good-Fair-Poor-Priority)

The Village began with a standard tree rating system to rate its ash trees. Due to the aggressive infestation of EAB, an additional category was needed to better manage our tree removal program. The Village's Good-Fair-Poor system was adjusted to include "Priority." An ideal scenario would be to create a rating system that identified poor trees and have them removed before the "good" trees deteriorated to "poor." Far from ideal, the Village's large ash tree inventory is in severe decline and the amended rating system provides some guidance for the systemic removal of severely degraded ash trees (priority).

Contractor by Neighborhood

Groundskeeper Landscape Services is tasked to perform Village-wide ash tree removals. To ensure efficiency the contractor progressively moves from neighborhood to neighborhood. To better facilitate and prioritize contractor removals, neighborhoods are evaluated and staff creates a more detailed list of tree sizes within a targeted neighborhood. The list also assists staff in monitoring and predicting contractor invoice cost based on a tree's DBH (diameter at breast height). Removing trees proactively and reactively, the Village uses the following process for prioritizing the order of tree removals.

Staff Removals (Targeted Removals)

A four person village crew is tasked to augment the contractor's tree removal efforts by removing trees throughout the Village categorized as "priority." Staff will locate these targeted trees either by observation or through the Village's work-order process. Because hazardous conditions exist in nearly all parts of the Village, and to ensure that a moderate level of attention is given to the entire Village, the four person tree removal crew must consistently relocate to different areas of the Village to extend removal efforts to the various neighborhoods. Crews will generally perform tree removals in a neighborhood for a maximum of two weeks before moving to a different neighborhood.

In general, staff targeted tree removals are categorized as follows:

1. **Good:**
    a. Trees are infected, but in relatively good condition
    b. Trees will eventually be removed, but not the primary focus
    c. Full to moderate canopy; some tree dieback (dead branches)
2. **Fair:**
    a. Trees are infected, but show signs of deterioration
    b. Wilting and yellowing foliage throughout the tree or limited to certain branches
    c. These trees will be removed, but they are not the primary focus
    d. Declining to moderate canopy (above 50%)
3. **Poor:**
    a. Trees have some canopy foliage, but in an obvious state of decline
    b. Trees will be removed as a secondary focus
    c. Canopy less than 50%
    d. Canopy thinning and branch dieback occurring initially in the upper third of the tree
4. **Priority:**
    a. Trees requiring immediate and high priority focus
    b. Trees having zero canopy that may pose a danger to life and property
    c. A large number of shoots that arise below the dead portions of the tree, particularly at the tree base
    d. Larger dead/dying trees that can cause injury to persons or property
    e. Trees having zero canopy with moderate to large diameter dead branches, located in high traffic and pedestrian areas or areas in direct proximity to property

Photo Examples of VOP Tree Removal Categories

Healthy Ash Trees

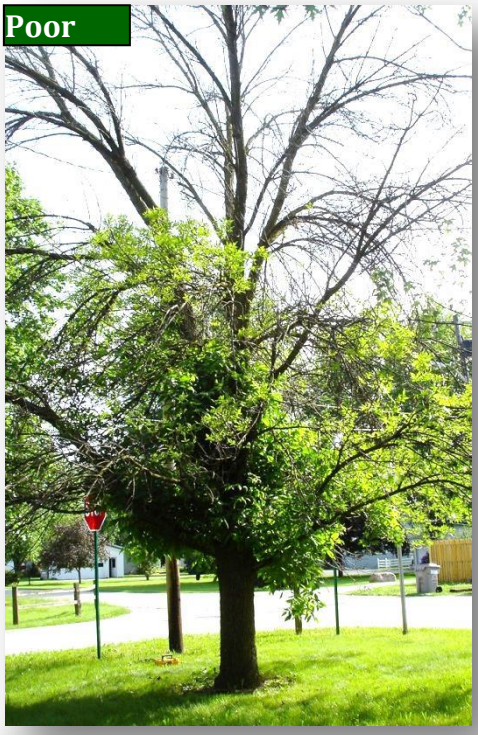
Good

Fair

Poor

Priority

Poor



Priority

Priority

Priority

Priority

Community Comparisons (Varying Responses to EAB)

Communities across the region had varying levels of responses to their respective EAB infestation. It appears that most if not all of the communities reviewed responded to their EAB infestations with phased plans that were limited by their respective budgets.

Removal Only

The communities of Libertyville and Mundelien, with small ash tree inventories, made the decision to remove and replace their trees without consideration for treatment. Some larger communities like Naperville and Chicago with well-staffed forestry divisions, were able to begin treatment of their inventories in 2008, which led to fewer ash trees being removed.

-Villages of Niles and Norridge-

Two smaller communities made the decision to focus much of their attention and resources on treating their ash trees. The Villages of Niles and Norridge have relatively smaller ash tree inventories than Orland Park (Niles 450; Norridge 370). Both communities have what arborist refer to as "manageable" ash tree inventories. Even with a modest inventory of 370 ash trees and an aggressive treatment program, the Emerald Ash Borer's inevitable pattern of destruction became clear prompting the Village of Norridge to remove 46 ash trees *(12% of the total ash tree inventory).*

Ash Tree Inventory Comparison

Community	Total Area	Population *(2010 Census)*	Total Parkway Tree Inventory	Parkway Ash Tree Inventory	% of Total Inventory
Niles	5.85 sq. mi.	29,803	8,500	450	5%
Orland Park	22.16 sq. mi.	57,016	28,803	8,085	28%
Norridge	1.81 sq. mi.	14,572	6,000	370	5%

Treatment and Removal

In general, communities that discovered EAB early on used insecticidal treatment as an option. In most cases, communities understand that the only definitive method of eradicating EAB is ash tree removal. Mokena and Tinley Park, while engaged in aggressive removal programs, have expended funding to treat otherwise healthy ash trees. Mokena is treating 200 of their ash trees, but they are removing the remaining ash tree inventory of 3,400 trees. Tinley paid nearly $58,000 to treat 600 of their ash three inventory, with the rest being contracted out for removal. Downers Grove created a phased plan to chemically treat their entire inventory of 3,860 trees from 2008 through 2012 and has taken down only a handful of ash trees.

The City of Des Plains decided to remove its entire ash tree inventory of 3,700 trees in 2012. During a council meeting aldermen and residents questioned why treatment of ash trees was not being offered as an alternative to replacement. Staff members explained that because all of their ash trees were likely infected to some degree, treatment would merely prolong the death of the trees.

Insecticide and Treatment

Best practice authors all agree that chemical ash tree treatment is best served when EAB has not affected a given tree. It is also a consistent theme that insecticidal treatments are more effective when the tree is in its initial state of decline having a canopy above 50 to 60%. It is also commonly agreed that Ash trees infected by EAB have a much lower likelihood of recovery when chemicals are introduced to trees falling below these standards. By the time the emerald ash borer is verified in a

community by the Department of Agriculture, the EAB is certain to have a well-established presence in the community.

According to the Illinois Department of Agriculture, the Emerald Ash Borer was confirmed in the Village of Orland Park, Illinois, on July 27, 2010 (10 IDA EM-066). Experts assert that EAB kills ash trees within three to five years of infestation. According to the Illinois Department of Agriculture, within two (2) years of observing symptoms most of the crown of the tree will be dead. Complete tree death typically occurs within five (5) years, but may take as few as 2-3 years. According to experts at

the Morton Arboretum EAB infestations usually go undetected until trees begin to show symptoms of infestation. It may take at least one year before symptoms first appear. It is at this point that insecticidal treatments would be most effective. Unfortunately, the ash trees that have been removed in the Village of Orland Park over the past two years have in, most part, been trees that are completely dead and those having less than a 50% canopy. It would appear that the Village's EAB infestation, similar to many of the surrounding communities, has been both rapid and aggressive.

Ash Tree Value
The only definitive way to completely eradicate EAB and its long-term infestation is ash tree removal. While ash wood is valued for its strength and elasticity (often used for baseball bats, bows and tool handles) its aesthetic, community and general utile value is the same as those attributable to the oak tree, maple, lindens and honey locust trees. The Village's ash tree replacement program will, in most cases, replace every ash tree that is removed one-for-one.

Insecticide Use
Applying protective insecticide treatments to a healthy ash tree to prevent an EAB infestation is the best strategy for managing EAB. However, if a tree becomes infested and the infestation is detected early, you may be able to treat your ash tree to prevent further damage and help the tree recover. Research suggests that insecticide treatments are significantly more effective on EAB-infested ash trees with less than 50% canopy thinning. Insecticide treatments are not recommended for trees with greater than 50% canopy thinning; these trees should be removed. Trees that become infested with EAB and are not treated will ultimately die and will need to be removed. Insecticides can also be used as a means of controlling the decline of an ash tree inventory allowing for a successful implementation of long term ash tree removal plan. Communities may use insecticide to aggressively treat their larger DBH trees that are located in historical districts. Universities have used treatments to study and monitor the relative decline of trees once EAB has been identified in the tree. Larger cities that detected EAB early on were able to use insecticidal treatments to treat their entire ash tree inventories.
http://labs.russell.wisc.edu/eab/files/2012/12/Is-My-Ash-Tree-Worth-Treating-for-Emerald-Ash-Borer.pdf

Insecticide effectiveness
- Most insecticide control measures against EAB must be used each year for the life of the tree.
- Most ash trees have life spans of well over 30 years generally reaching maturity after 20 to 25 years.
- Insecticide treatments may not be effective in controlling EAB in your ash tree. Storm damage, other injuries to the tree, age of the tree, soil moisture, soil compaction and other site and environmental factors influence the effectiveness of these products.
- **The only proven method of ending EAB infestation is ash tree removal.**

- Treatments are most effective as prevention, before EAB finds the tree. If your tree has an early EAB infestation – less than 40 percent dieback of crown – treatments may stop the infestation.
- Treatments are suggested only if you live within 15 miles of a confirmed EAB infestation.

http://www.extension.iastate.edu/pme/Publications/EAB/MGMTPM2084EmeraldAshBorer0609.pdf

Treatment Cost and Removal/Replacement Cost

According Municipal costs for ash tree treatment can range anywhere from $7.00 to $14.00 per diameter at breast height (DBH) depending on the DBH (diameter at breast height) of the tree. Chemical applications must be repeated every year or every other year depending on the chemical being used. The treatment must be applied for the life of the tree.

VOP Removal (only) vs. Treatment

Using current contract tree removal (only) numbers, a single ash tree can be treated for three (3) years for the same cost needed for tree removal. As in the case of Orland Park, lower than average tree removal costs, can change the long term outcome of treatment vs. removal costs.

Using the assumption that a replacement tree matures in twenty (20) years, it currently costs the Village an average of $230 to remove, stump grind and restore an ash tree. The Village's average ash tree size is between 16" and 18" DBH. Many arborists agree that an effective treatment for EAB ash trees is emamectin benzoate, used under the TREE-Age® brand, at a conservative cost of $7.00 per Diameter at Breast Height (DBH). Tree-Age must be applied every two (2) years. Using $126 for the treatment cost per tree (18" × $7.00), a comparison of treatment and removal costs could be demonstrated by the following:

Growth Year of Newly Planted Tree	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	***Year 9***	***Year 19***
Cost to Remove			$230							
Cost to Treat Existing Tree per Year	$126	-	$252	-	$378	-	$504	-	*$630*	*$1,260*

It is important to note that the cost to treat the tree must continue for the life of the tree. Another key point of the treatment and removal comparison is that chemical treatment does not guarantee the continued health of the tree.

*VOP Removal **and** Replacement vs. Treatment*

Using current removal and replacement costs ($410), the next chart demonstrates that the cost to treat a single tree would equal the cost to remove and replace a single tree in year (7) seven.

Growth Year of Newly Planted Tree	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	***Year 9***	***Year 19***
Cost to Remove & Replace							$410			
Cost to Treat Existing Tree per Year	$126	-	$252	-	$378	-	$504	-	*$630*	*$1,260*

Treatment costs for the tree would continue for the life of the tree making long term costs higher ($1,260) than the cost to remove and replace the tree ($410). Treatment dollars could better serve to offset the cost of removing and replacing the tree. Also, making the case for removal/replacement, the replaced non-ash tree would have reached maturity by year 15.

Conclusion

Management of EAB is a complex topic. Applying lessons learned from leaders in EAB Management like the Department of Agriculture in Michigan, Ohio and Wisconsin, only give guidelines in the decision making process. Ultimately, communities must make decisions based on budgets, staffing levels and level of ash tree decline. According to the Illinois Department of Agriculture, EAB was confirmed in the Chicago region in 2006. Since that time, communities have adopted one of two options: treatment and removal, or removal only.

Treatment in the early stages of EAB infestation is effective in that the tree has a better chance of surviving with lifetime treatments. There are also instances where treatment during the more advance stages of infestation can extend a trees useful life. Unfortunately, treatments and insecticides have only proven to prolong the life of ash trees infected with EAB. All experts agree that the removal of ash trees is the only 100% effective method of eliminating EAB. Orland Park and its surrounding communities are experiencing an aggressive and devastating infestation of EAB. While treatment may provide a temporary solution to some trees affected by the EAB, long term costs analysis, particularly in the case of Orland Park, reveal that insecticidal treatments would prove more expensive than removal.