



# BLE for Floodplain Management

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February 29, 2024

Helena, MT AMFM Conference



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# Family Owned. Client Centric. Community Driven.

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  - Arlington, VA
  - Surveying and Mapping
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  - Architecture
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  - Engineering
  - Environmental
  - Geospatial, mapping, and survey
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  - Technology



**2,500+**  
EMPLOYEES



**60**  
LOCATIONS  
nationwide



**\$711.45**  
MILLION  
in 2023 revenue



**65+**  
YEARS

helping clients build  
and shape communities

# Industry Benchmarking

## 2023 ENR Top 500 Design Firms

Currently #34

## 2022 ENR Sourcebook Rankings

30<sup>th</sup> Top 50 in transportation

20<sup>th</sup> Top 25 in water supply

36<sup>th</sup> Top 50 in general building

14<sup>th</sup> Top 25 in government offices

31<sup>st</sup> Top 50 in telecommunications

25<sup>th</sup> Top 100 “pure designers”

Top AEC Firm, *Public Works*

Top Firm, *Healthcare Design*

Top Civil Engineering Firms, *CE News*

Giants 300, *BD+C*

Currently #28

Architect Top 50 – Sustainability

Currently #28

# Agenda

**What is best available information? How does BLE fit in?**

→ **What are BLE Option Levels**

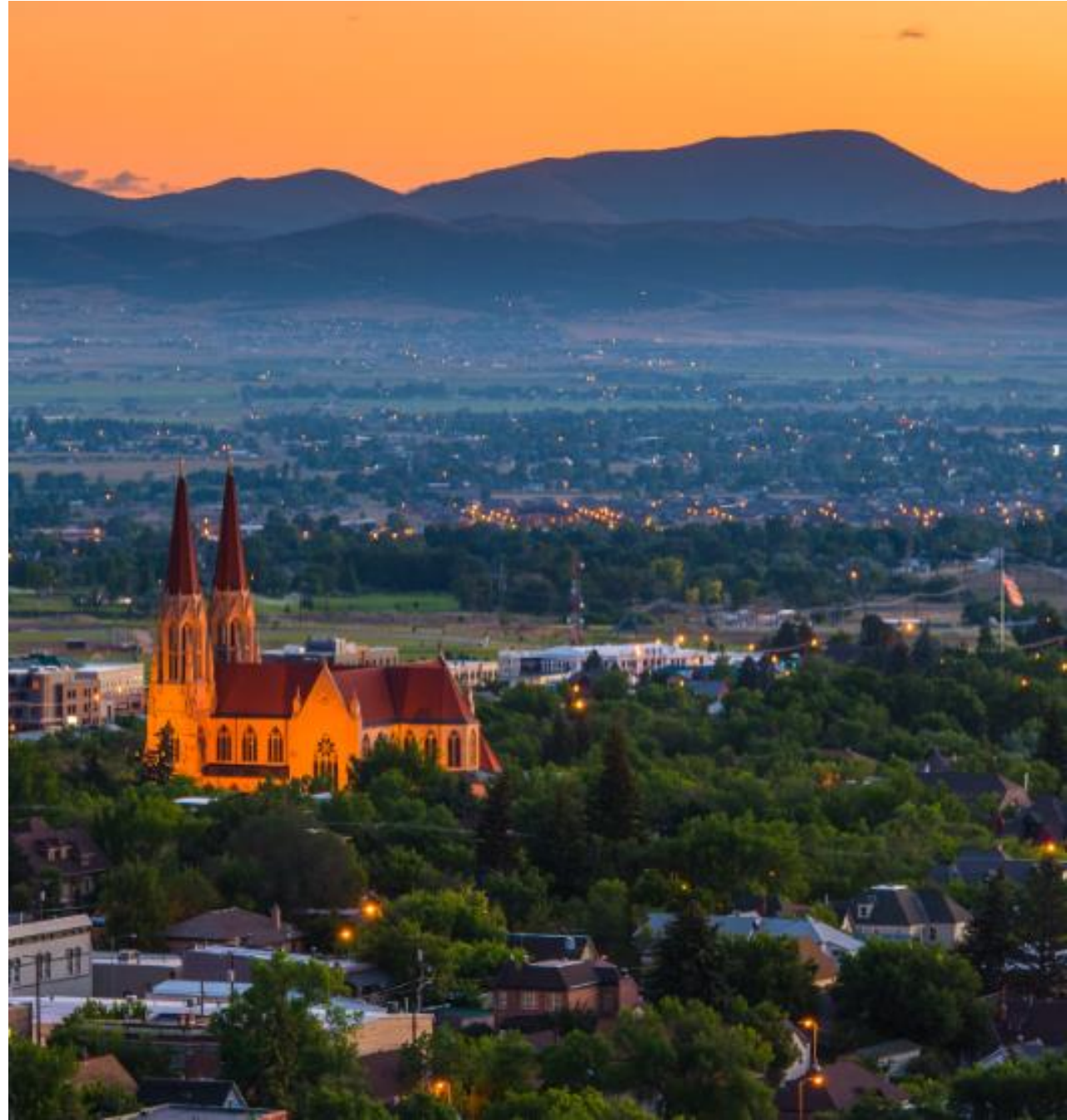
→ **What is Best Available Information**

**Applications for BLE**

→ **Interpreting BLE for Permitting**

→ **Making BLE Regulatory Through An Ordinance Update**

**Conclusion**



# What is BLE?

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# What is Base Level Engineering?

## KEY TERM

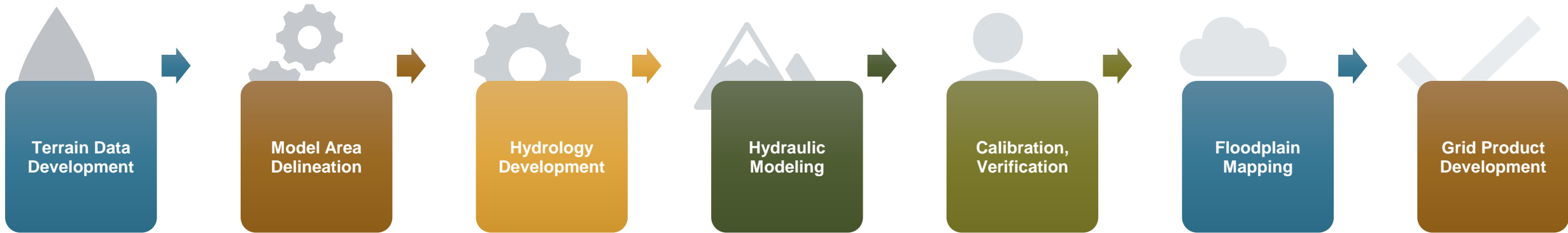
**Base Level Engineering (BLE)** is the method in which accurate flood risk information is developed using ground elevation data and modeling software.

- BLE focuses on unknown, unmodernized, and unmapped areas.
- BLE shows flood extents, flow velocities, flood depths, and water surface elevations on a large scale, such as a watershed, community, or county.
- BLE studies can use one-dimensional modeling (1D) or two-dimensional modeling (2D), depending on the needs and traits of the watershed.

## Key Benefits

- ✓ Data is delivered much earlier in the mapping process
- ✓ Comprehensive picture of flood risk across a watershed area
- ✓ Provides modeling to support flood mitigation strategies and projects
- ✓ Information to support local planning and development decisions for multiple community departments
- ✓ Advises local and regional emergency planning and response operations
- ✓ Expands and enhances local flood risk communication initiatives

# BLE – Technical Workflow





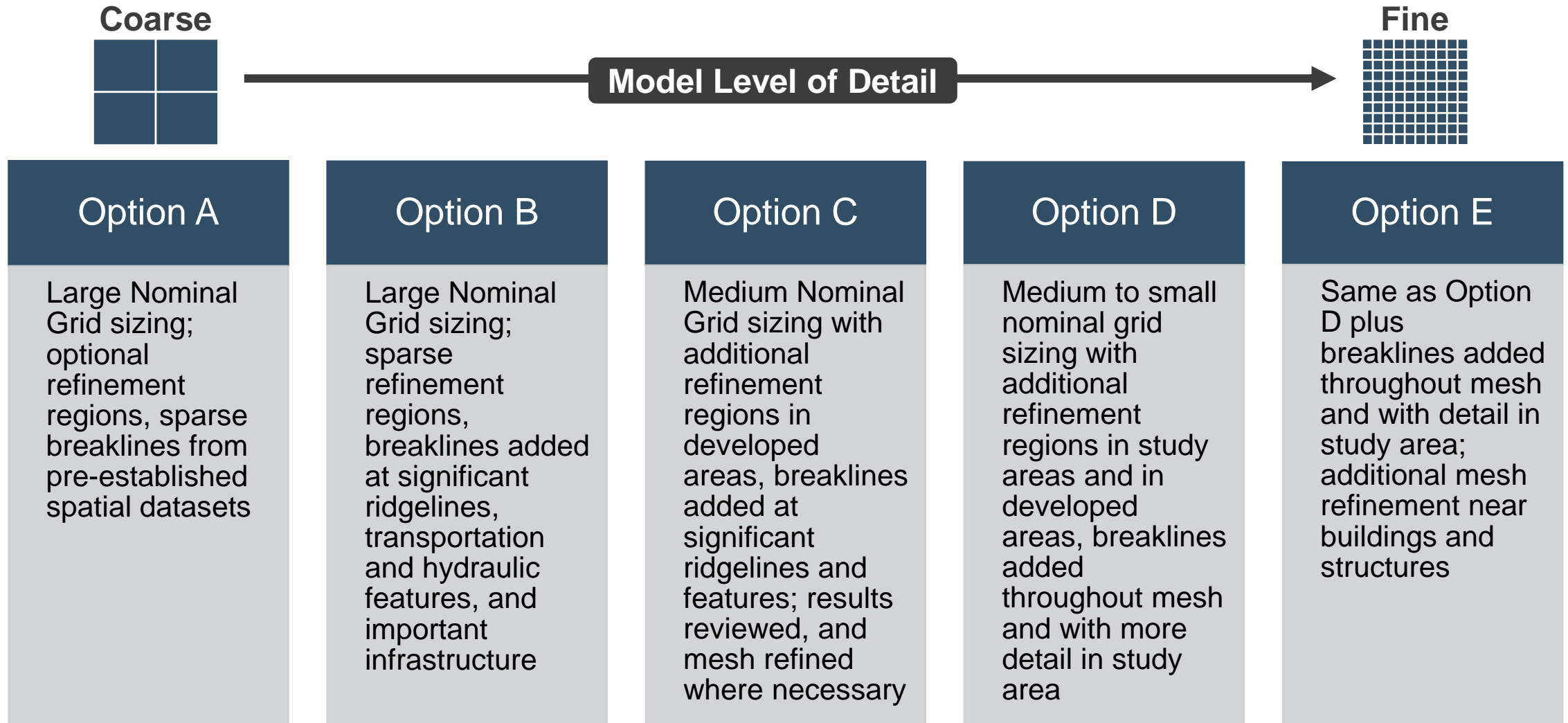
# What are BLE option levels?

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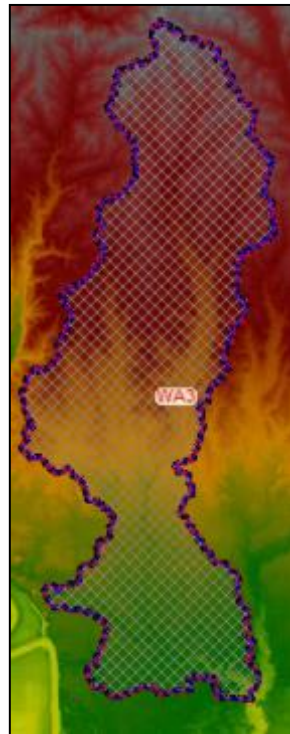
# BLE – Option Levels

- Option Levels define scope and methodology
  - Range from A → E (not be confused with Flood Zone)
  - Planning → Best Available → Regulatory Zone A → Regulatory Zone AE
- As Option Level increases so does the level of detail

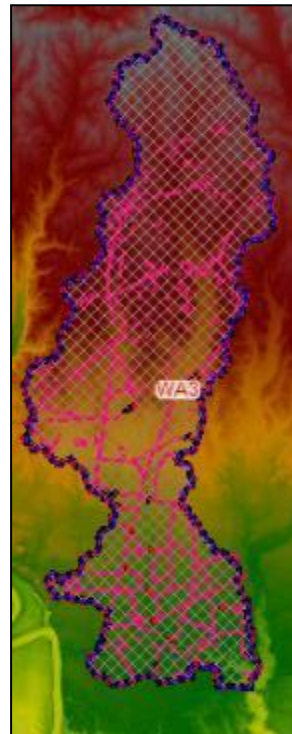
# BLE – Mesh Refinement



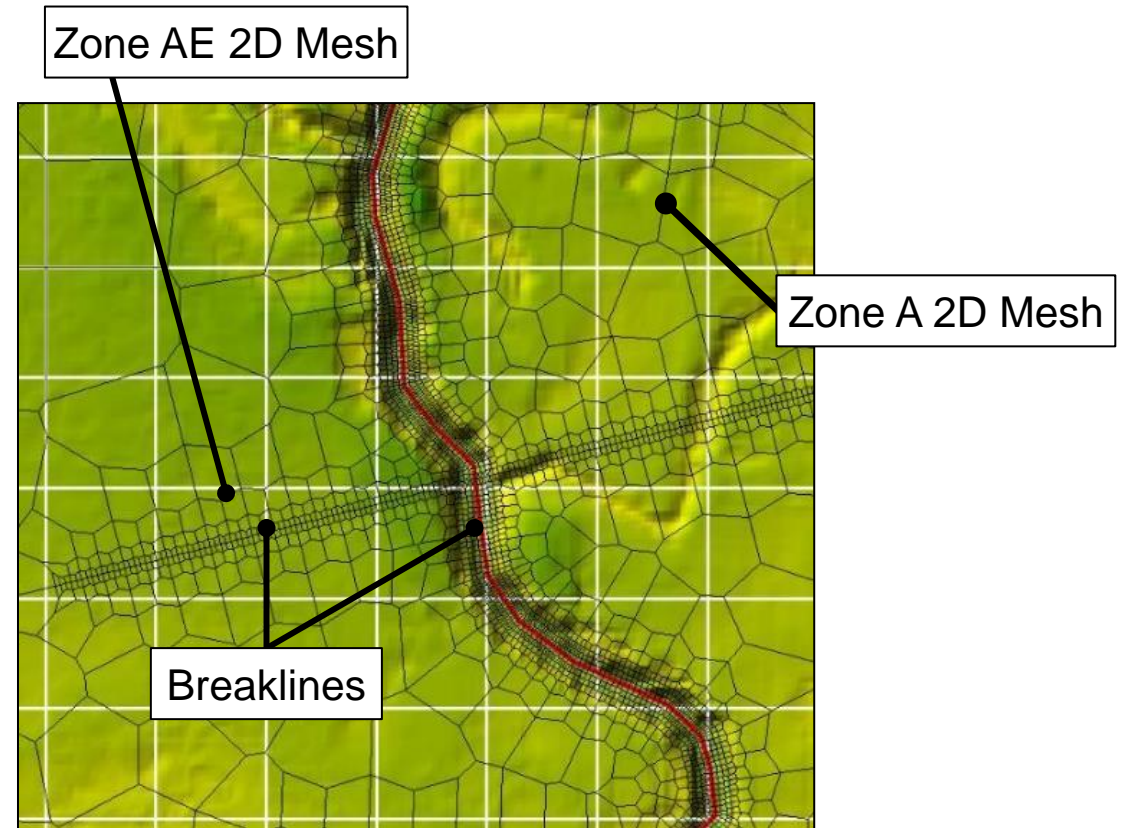
# BLE – Mesh Refinement



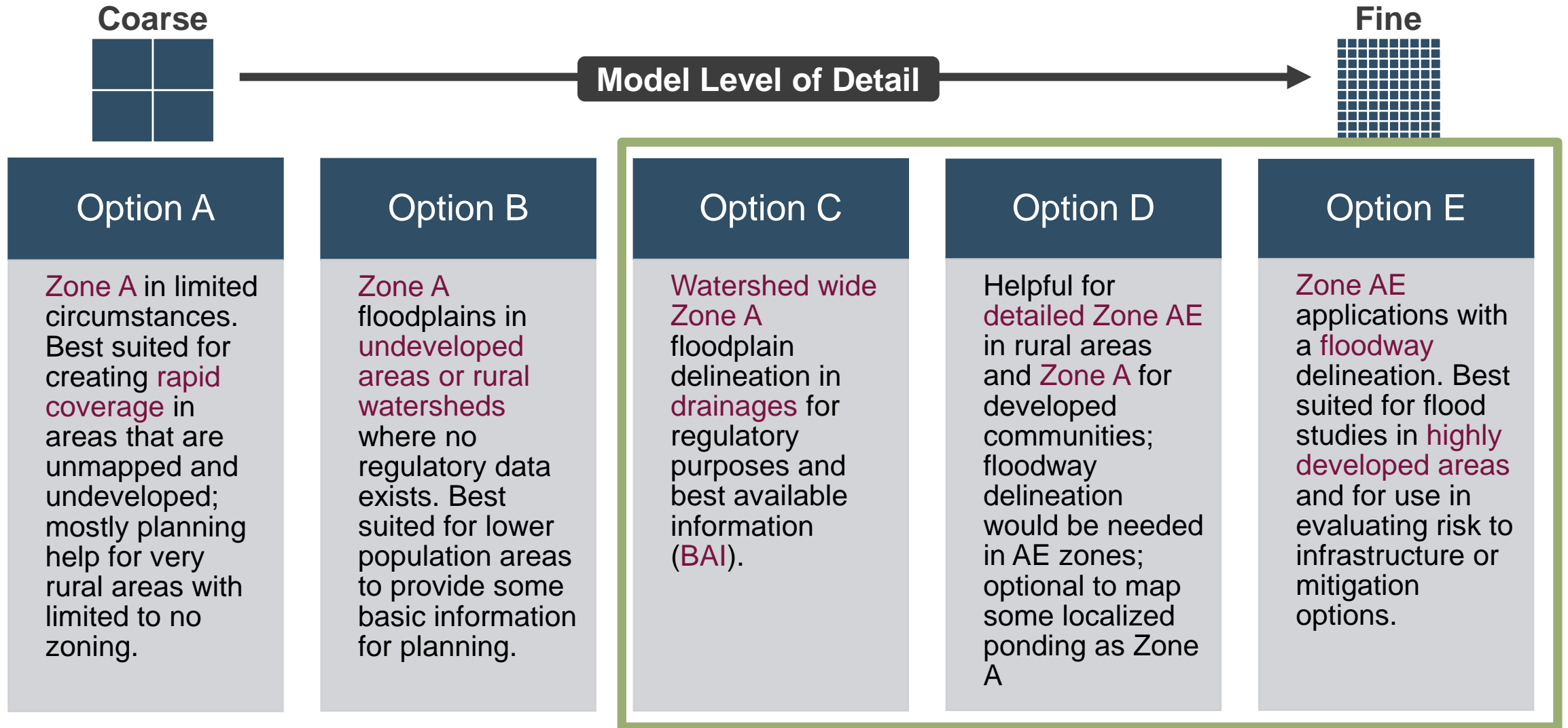
No Refinement



Refinement

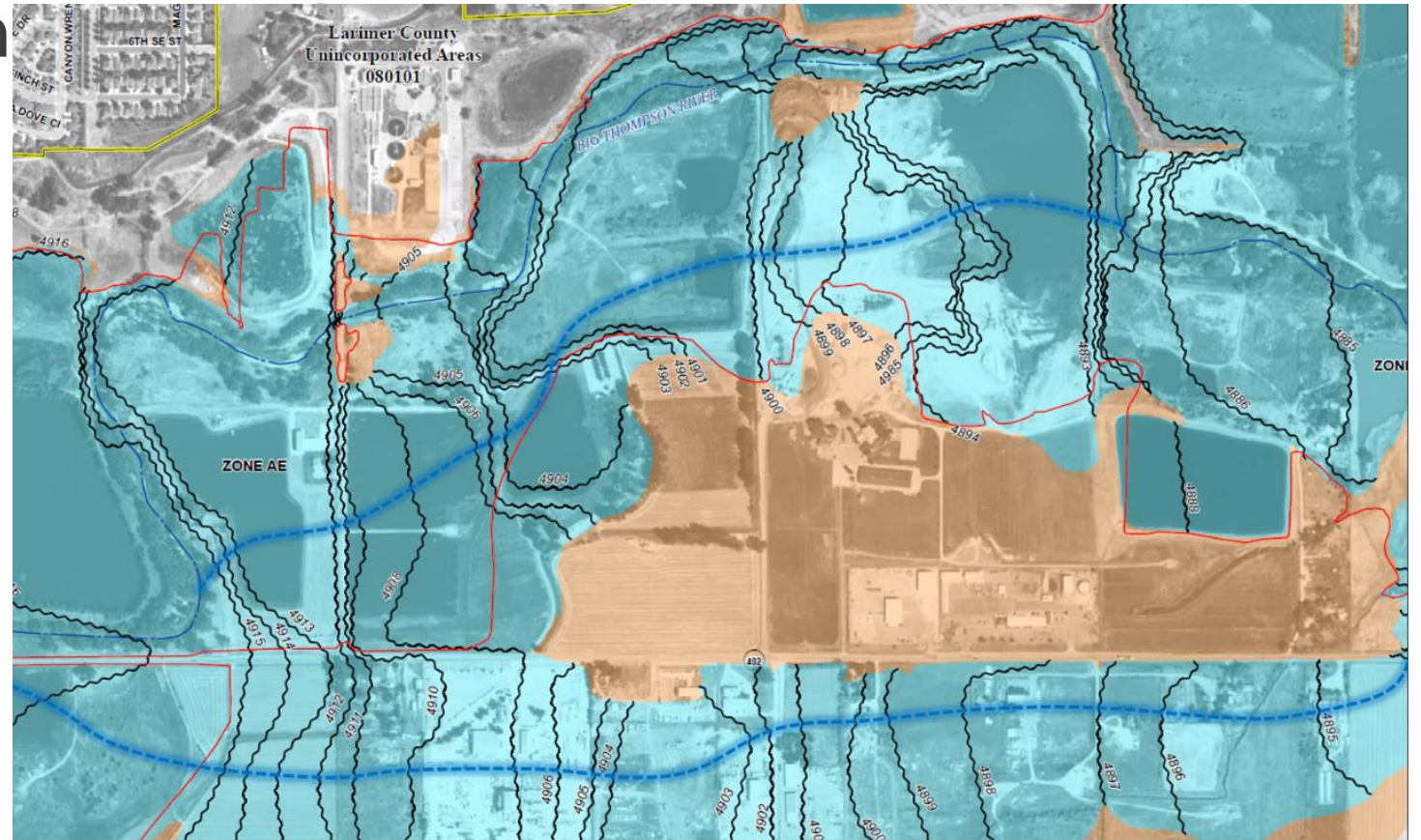
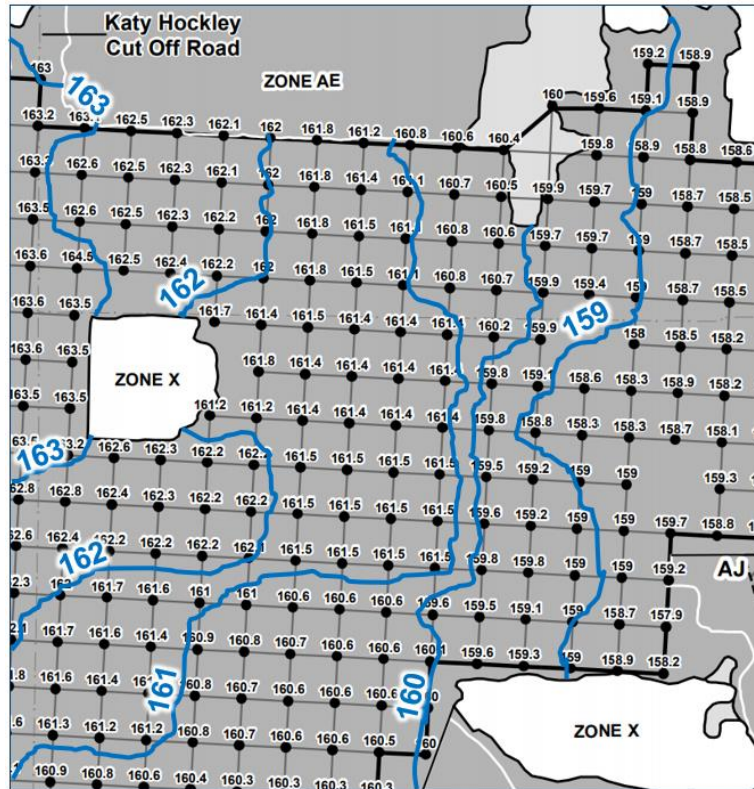


# BLE – Regulatory Applications & Uses



Applies to Montana

# BLE – FIS and FIRMs



# What is Best Available Information?

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How does BLE fit in?

# Best Available Information

## KEY TERM

### **Best Available Information (BAI)**

Communities may adopt best available information for use in local development decision-making, community planning, and emergency response planning.

This means the most conservative BFE/floodplain result.

Base Level Engineering (BLE) data can be used as the best available information in areas designated as Zone A on Federal Emergency Management Agency's (FEMA) regulatory Flood Insurance Rate Map (FIRM) products. It can also guide regulations in areas where no Special Flood Hazard Area (SFHA) has been identified or mapped.



# What is Risk MAP and where does BLE fit in?

Risk Mapping, Assessment and Planning (Risk MAP), is the process used to make Flood Insurance Rate Maps, or flood maps. Risk MAP also leads to more datasets, hazard mitigation analysis and communication tools.

## At what stage in the Risk MAP process is your BLE available?

BLE is the approach to identifying your flood risk. It is typically delivered during the discovery phase.

## When do you use BLE?

BLE data can be adopted as Best Available Information for permitting and regulation while waiting for a regulatory FIRM.

## What happens at map adoption?

BLE can either become the FIRM or can be used in addition to the FIRM for more conservative risk. Once BLE is adopted into the FIRM or the local ordinance, it becomes what the community regulates to.



Discovery



Analysis &  
Mapping



Preliminary  
Flood Map  
Release



Map  
Adoption

# Best Available Information

Communities should use Base Level Engineering information when:



BLE coverage shows an area as flood-prone that is **NOT** currently depicted on the FIRM



BLE coverage is similar in width, shape, and alignment to the Zone A depicted on FIRM



BLE coverage is larger than Zone A areas shown on FIRM

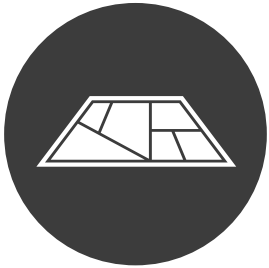


Communities should not use Base Level Engineering information when BLE coverage is smaller in width and shape than Zone A areas shown on FIRM

# Applications for BLE

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# BLE Applications



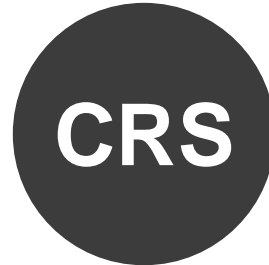
Zoning district updates



Land use code/ordinance updates



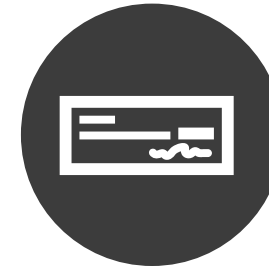
Permitting



Community Rating System points



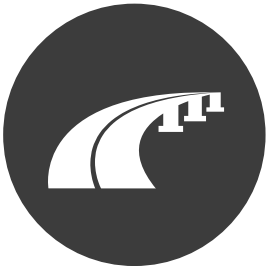
Mitigation project planning



Grant applications



Stormwater management and design



Flood evacuation route planning



Reverse 911 system updates



Emergency shelter planning



Capital Improvement Project planning



Outreach applications



Social Vulnerability analyses



Elevation Certificates

# Shall vs. Should



## Shall

Indicates a regulatory requirement

If the community adopts BLE data into their local ordinance, they must regulate to that data.



## Should

Indicates best practice

If the community has not adopted BLE data, they should use the it as best available data for evaluation and decision-making around flood risk.

# Workflow for Finding the BFE at Your Point of Interest

## Check Effective FIRM

If point of interest is in a special flood hazard area, document the flood zone and BFE. If not in the special flood hazard area or no BFE is available, move to next step.

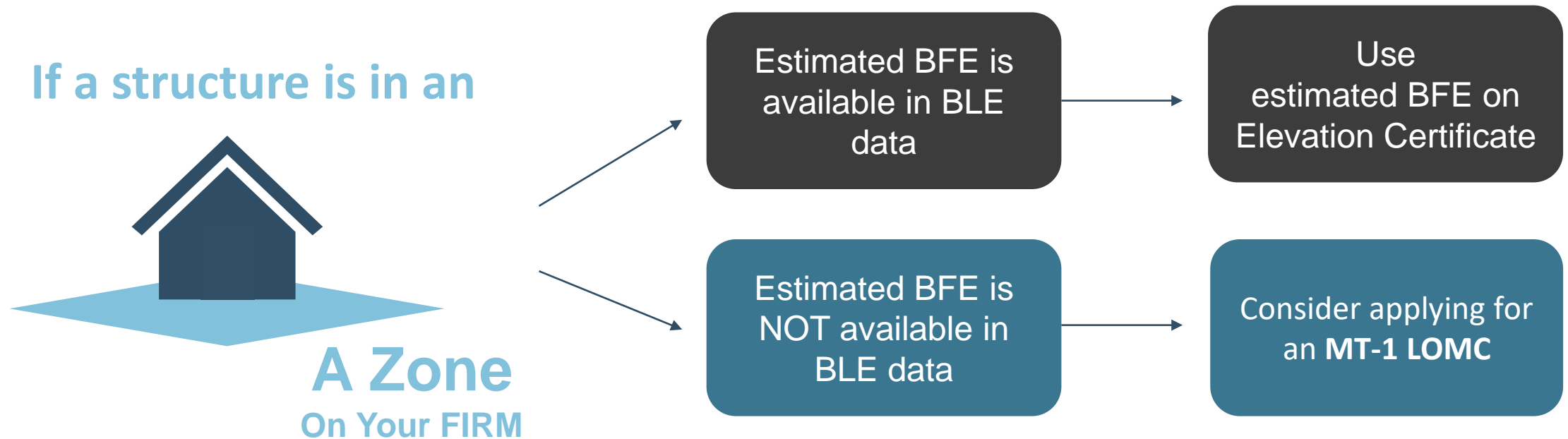
## Check BLE Data

If BLE information is available, run site report or use 1% Water Surface Level (WSEL) grid from the BLE data. If not, use effective BFE if available.

## Is BLE Best Available Information?

If yes and Effective FIRM is ZONE A without an available BFE, then an estimated BFE (eBFE) can be used from BLE. If point of interest is in Zone AE on FIRM, use effective BFE.

# BLE Decision Matrix



# BLE Decision Matrix

If a structure is in an



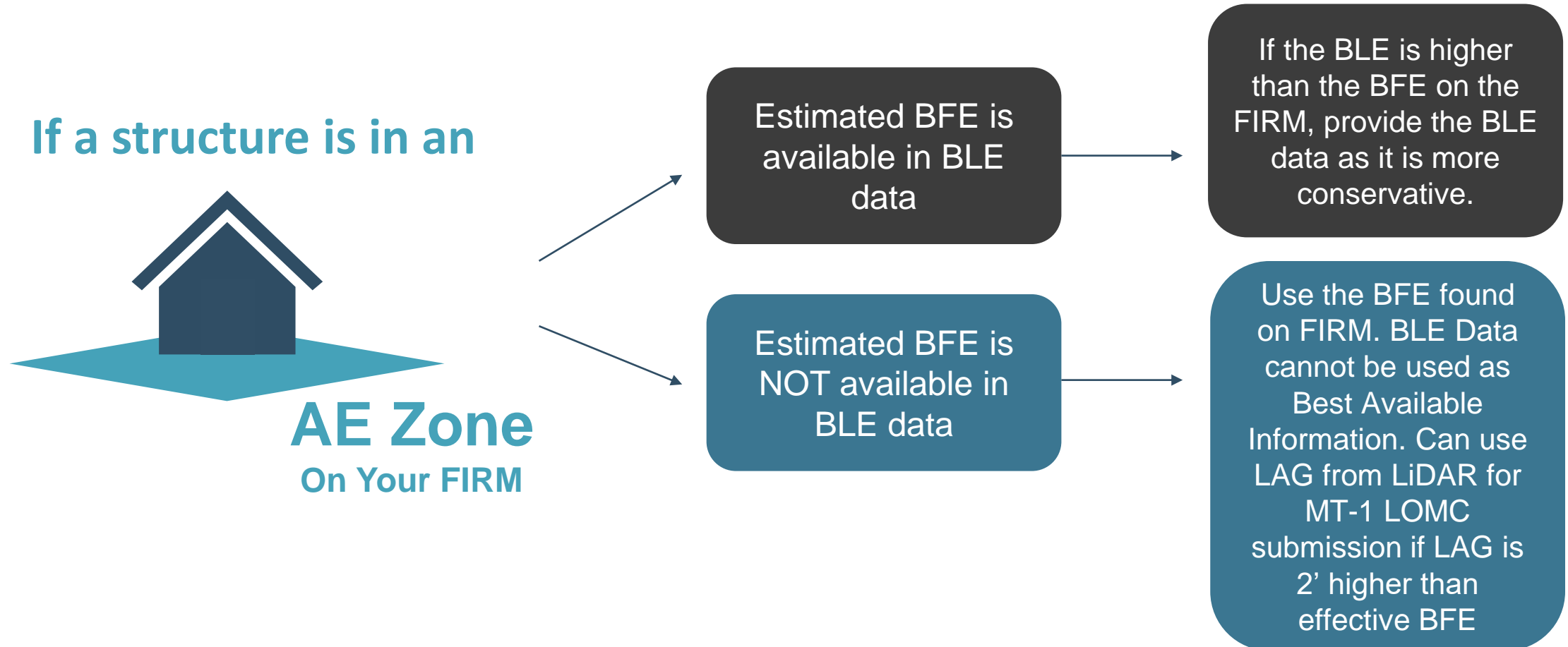
**A Zone**  
On Your FIRM

Estimated BFE is available in BLE data, but it is smaller in width and shape than Zone A areas shown on FIRM

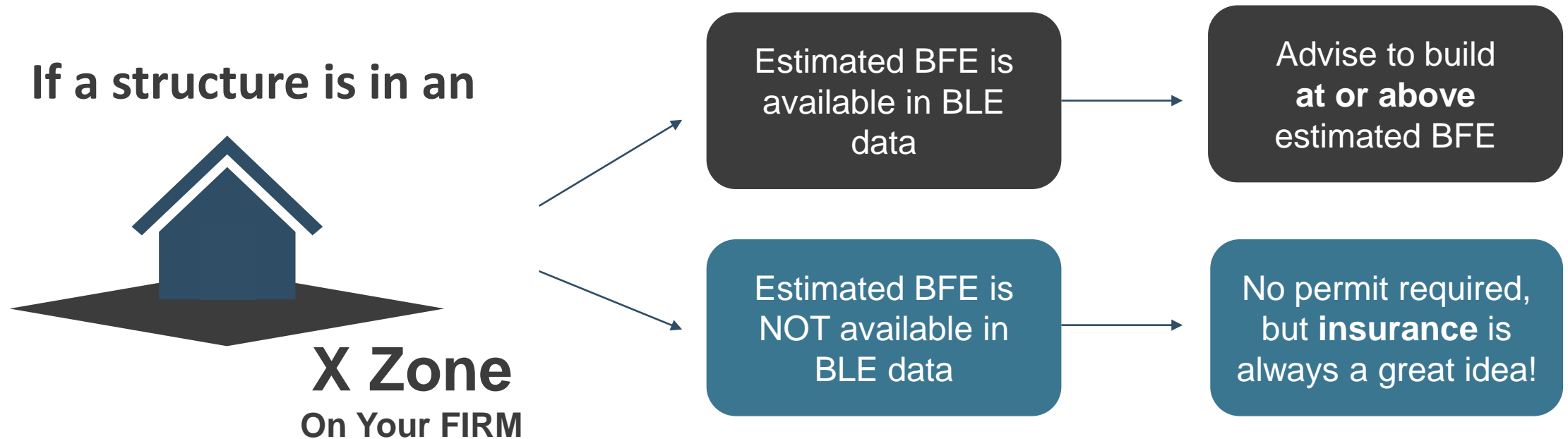
Do not use Estimated BFE from BLE. Use the BFE found on FIRM.



# BLE Decision Matrix



# BLE Decision Matrix



# BLE Decision Matrix

If a structure is NOT in an



**A Zone**  
On Your FIRM

And there is an adjacent  
freeboard area established  
in local ordinance



Estimated BFE is available in BLE data



Use estimated BFE and include the appropriate freeboard requirement

Estimated BFE is NOT available in BLE data

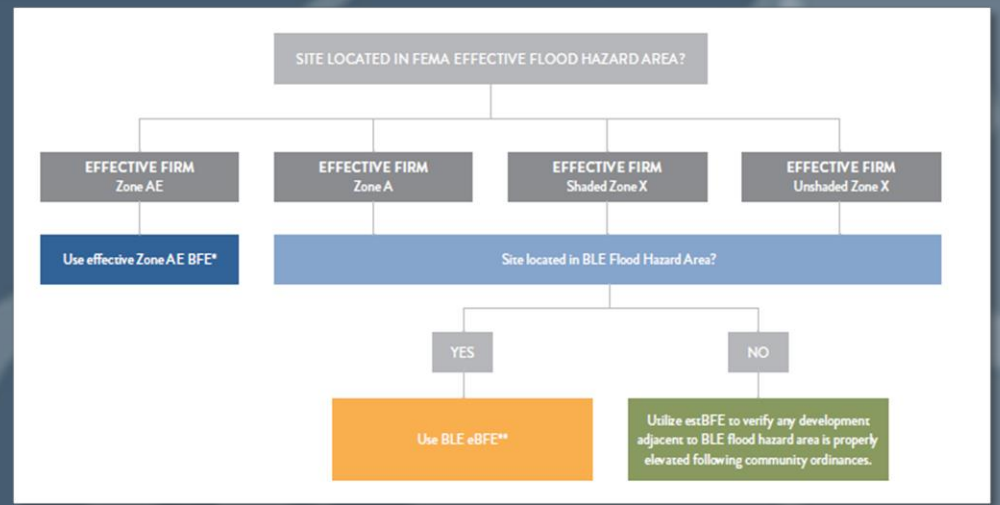


Use estimated BFE and include the appropriate freeboard requirement

# BLE Playbook



- ### Use BLE as Best Available Information
- ✓ When no flood hazard information is shown on your FIRM
  - ✓ Where BLE is similar OR more conservative
  - ✓ BLE data compliments FIRMs where they exist and current flood coverage is minimal
  - ✓ Can be adopted and used as Best Available Information by locals without FIRM or Ordinance update
  - ✓ When BLE overlaps a Zone AE on the FIRM, BLE should NOT be used for any purpose\*
- \*The BLE analysis results can be used to validate and, if needed, supplement the effective floodplain modeling for Zone AE streams while developing corrected effective floodplain models. See Section 2.c for more information.



## THE GEORGIA COMMUNITY BLE PLAYBOOK IS BROKEN INTO THREE SECTIONS:

- I. Floodplain Management**  
This section discusses how the information provided from BLE analysis can be used as the best available information for permitting, better enforcement, map amendments, and - in some cases - to reduce flood insurance premiums.
- II. Planning, Design, and Other Applications**  
This section discusses how local developers and engineers can utilize BLE information to review the effects of land development and to aid with capital programs and community planning and zoning.
- III. Emergency Management**  
This section discusses how BLE data, such as depth grids and floodplain polygons, can be used for emergency management activities during and after an emergency incident as well as for mitigation planning before an emergency occurs.

# Interpreting BLE for Permitting

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## Permitting

# Overview

- Floodplain Development Permits are required **before construction or development begins within any SFHA**
- If FEMA has not defined the SFHA within a community, permits for all proposed construction or other development are required to **determine if it is proposed within flood-prone areas.**
- Permits are required to ensure that proposed development projects meet the requirements of the **NFIP** and the **community's floodplain management ordinance.**
- A community must also review all proposed developments to ensure that all necessary permits have been received from those **governmental agencies** from which approval is required by **Federal or State law**

# Interpret Base Level Engineering

- BLE provides modeled flood hazard data in either Special Flood Hazard Areas (SFHAs) designated as Zone A or where no effective flood hazard zone has been designated previously.
- BFEs are not always readily available for some effective Zone A studies. For this scenario, **BLE data can be used to determine the flood protection elevation required for permitting certain activities.** These activities include the construction of a new building, additions or substantial improvements of existing buildings, renovation of existing building interiors, and placement of manufactured mobile homes.
- BLE can also be used in addition to the FIRM for **more conservative risk.**



## Permitting

# Making BLE Regulatory through an Ordinance Update

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## Ordinance Updates

# Overview

- NFIP regulations identify minimum requirements that communities must fulfill to join and stay in the program.
- Requirements depend on its flood hazard and level of detail of data FEMA provides to the community.
- **Regulatory BLE only applies to use of flood data for floodplain management purposes when there is no published FIRM.**
- Insurance agents/lenders **must use current FIRM** when setting insurance rates & determining whether flood insurance is required.
- To obtain different premium rates that vary from current FIRM, or to opt out of a flood insurance policy, **the FIRM must be officially revised or amended.**

# Level of detail of data FEMA provides to the community



## Ordinance Updates

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### 44 CFR FEMA has provided...

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60.3(a) No maps or data.

60.3(b) **Map with approximate A Zones**

60.3(c) **FIRM with BFEs**

60.3(d) **FIRM with BFEs and a map showing a floodway**

60.3(e) **FIRM showing coastal high hazard areas (V Zones)**

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Want to read more? Specific requirements in 44 CFR **Section 60.3**

# How to make Base Level Engineering Regulatory

Duties and responsibilities of the Floodplain Administrator include **interpreting, where needed, the exact location of the boundaries of Special Flood Hazard Areas.**



## Ordinance Updates

Communities should use Base Level Engineering information when:



BLE coverage shows an area as flood-prone that is **NOT** currently depicted on the FIRM



BLE coverage is similar in width, shape, and alignment to the Zone A depicted on FIRM



BLE coverage is larger than Zone A areas shown on FIRM



Communities should not use Base Level Engineering information when BLE coverage is smaller in width and shape than Zone A areas shown on FIRM

Refer to Flood Damage Prevention Code **ARTICLE 2 SECTION 5 (b)** for more information

## Region 8 Example Provisions



### Ordinance Updates

The **community has elected to adopt Best Available**, including <Title of Study> Information to regulate floodplain development in addition to utilizing the effective FIRMs, FIS, and/or FBFM. Where Best Available Information contradicts the FIRMs, FIS, and/or the FBFM, the **more restrictive data shall be utilized**.

# Bottom Line-

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# Bottom Line



Use the most conservative data.



Always use the detailed study on your FIRM if available.



Know your ordinances in place. (freeboard)



Notify the Region if you want the BLE data refined for more detail.

# Questions?

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