

DECISION SUPPORT FOR BROWNFIELD DEVELOPMENT

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MULTI ATTRIBUTE DECISION MAKING PROCESS

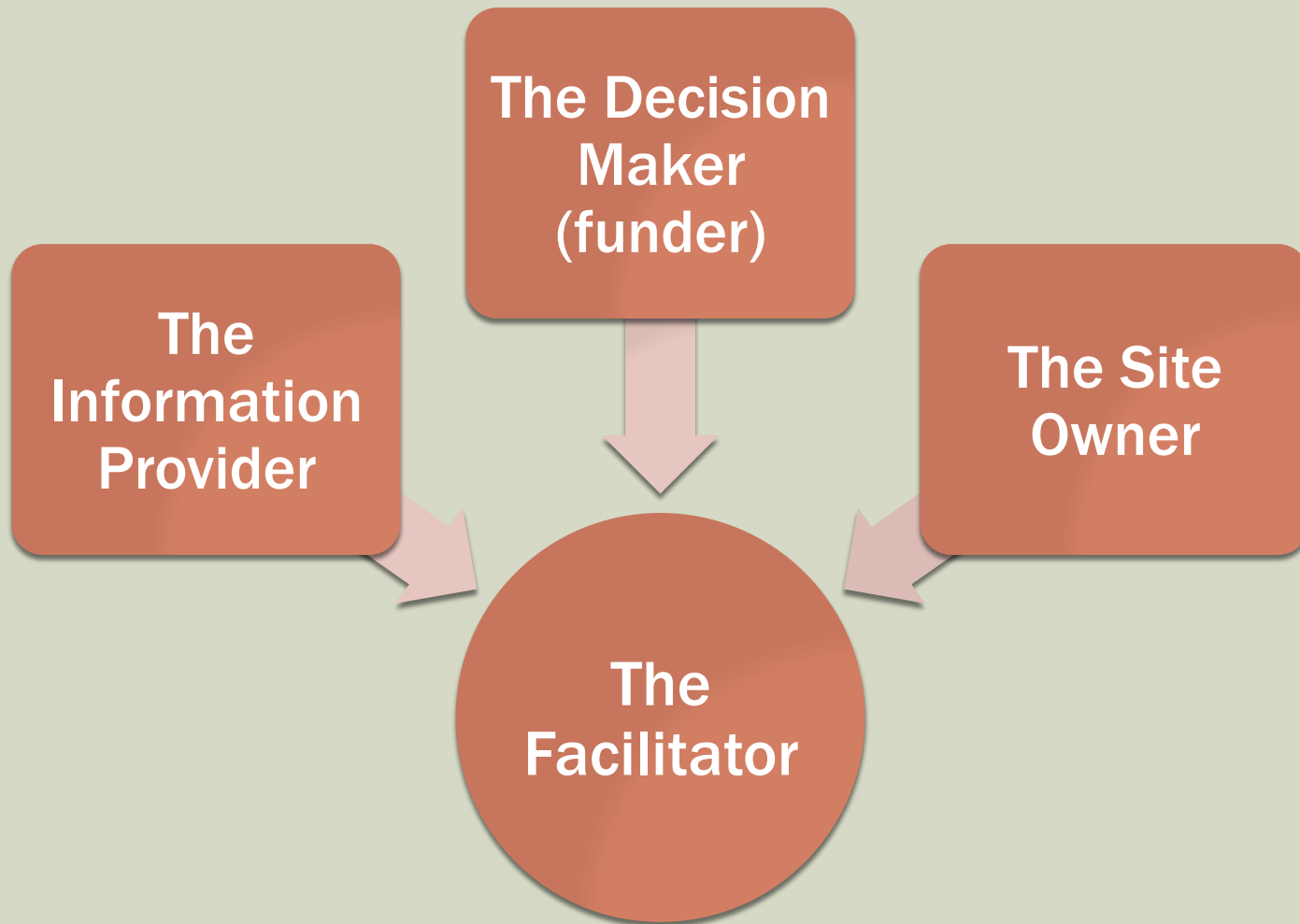
Multi-attribute decision making

- **Diagram problem**
- **Consider options and available information**
- **Allows for relative decisions**

Decision support, not decision making

- **Collecting and verifying information**
- **Assessing the problem**
- **Identifying alternatives**
- **Making logical decisions based available information**
- **Evaluating decisions and their consequences**
- **Informing others of the decision and its rationale**

THE PLAYERS



THE PROCESS



DATA COLLECTION - PROPERTY PROFILE

General Information

Property Owner

Site Information

Environmental Information

Local Demographics

DATA COLLECTION

SITE ATTRIBUTE QUESTIONNAIRE

Multi-page questionnaire organized by the following **CATEGORIES** helps to define the 'site:'



**Development
Driver/
Champion**

**Development
Potential**

Infrastructure

**Real Estate
Market
Information**

CATEGORY 1

DEVELOPMENT DRIVER/CHAMPION

Development Driver/ Champion

- An entity, preferably an individual, who organizes, instigates, and connects
- For example, private sector developer, local government official, community-based organization, or local redevelopment authority

CATEGORY 2

DEVELOPMENT POTENTIAL

Development Potential

- Likelihood of redevelopment
- Indicators
 - End use
 - Funding
 - Time
 - Labor market
 - Property ownership
 - Community support
 - Quality of life

CATEGORY 3 INFRASTRUCTURE

Infrastructure

- Availability of infrastructure adjacent to a site
 - Infrastructure can be a strength or weakness
- Indicators
 - Public utilities
 - Transportation systems

CATEGORY 4


REAL ESTATE MARKET INFORMATION

Real Estate Market Information

- Understanding of the surrounding community in which the brownfield site is located
- Allows for the comparison of the site with other (non-brownfield) properties in the area with respect to indicators:
 - Property values
 - Potential tax revenues

ASSIGNING VALUES - AS A WAY TO QUANTIFY SITE CHARACTERISTICS

Questionnaire responses assigned a numeric value



'Values' entered into spreadsheet



'Values' are 'weighted' given priorities of decision maker

FINAL SCORE FOR A SITE

$$Score = \sum_c \left[W_c * \sum_i W_i * \bar{I}_i \right]$$

- C = Category
- i = Indicator
- I = Vector that defines the responses to questions in Indicator I
- W = Weight

THE STEPS TO DEFINE AND WEIGH PRIORITIES

Decision Makers

- Assemble as a group
- Develop common understanding of indicators
- Assign weights

Facilitator

- Collect data from Decision makers
- Conduct discussion to result in consensus

Optional

- Pair-wise comparison to validate results

TRIAL APPLICATION OF THE MADM PROCESS

- Statewide community development organization
- 17 Communities, 79 Sites
- Screened via 'Profile' – reduced to 30 Sites
- 23 Questionnaires submitted
- Weights (based on facilitated discussion with Board members)
 - Champion – 30%
 - Development Potential – 48%
 - Infrastructure – 17%
 - Real Estate Market Information – 5%

EXPECTED OUTCOMES

Ability to compare similar properties

- Size
- Level of environmental contamination
- Local demographics

Ability to look at individual indicators

- Champion
- Development Potential
- Infrastructure
- Real Estate Market Information

Compare calculated 'rankings' to 'intuitive' rankings

- Calculations cannot capture all 'intangibles'
- Results will get you in the 'ballpark'

Decision support

- Rational
- Transparent

LESSONS LEARNED

MADM tool is effective if more than 10 sites are to be compared

MADM process forces decision makers to clarify their objectives

Decision makers might see value in tool, but community participation requires incentives: “what is in it for me?”

- Grants
- In-kind support

If calculated results are not similar to intuitive results, then

- Questions might be ambiguous
- List of questions might need to be modified

THANK YOU

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 - US Environmental Protection Agency
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 - Amy Nagangast
 - Yeganeh Mashayekh
- **Contact information**

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