



# Decision Name: Example : Selecting an Air Conditioning System

Project: Example Project

## 01. Decision Summary

Due Date	Decision Status	Selected Alternative
2016-05-04	In Progress	Ductless Mini Split (VRF) system

### Objective

We have a 6 story commercial office space that we must choose an HVAC system for.

### Collaborators

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### Tags

- building
- mechanical
- system
- high
- rise

### Notes

We need to make a schematic design decision on which type of HVAC system to use

## 02. Alternatives

### Package Unit with metal duct on deck

Reliable American technology

### Split AC system with metal duct on deck

Reliable American technology

### Ductless Mini Split (VRF) system

New technology from Japan

## 03. Factors & Criteria

### Ease of Constructibility

**Want Criterion :** want the simplest construction possible

### Occupancy Comfort

**Must Criterion :** must be comfortable

### Indoor Air Quality

**Want Criterion :** prefer better indoor environment

### Flexibility for Future Change

**Want Criterion :** want more flexibility for future change

## 04. Attributes

### Ease of Constructibility

<b>Ductless Mini Split (VRF) system:</b> Can be constructed in 1 month	<i>Met meet must criterion</i> ✓
<b>Package Unit with metal duct on ...:</b> Can be constructed in 4 months	<i>Met meet must criterion</i> ✓
<b>Split AC system with metal duct ...:</b> Can be constructed in 6 months	<i>Met meet must criterion</i> ✓

### Occupancy Comfort

**Must Criterion:** must be comfortable

<b>Ductless Mini Split (VRF) system:</b> Superior comfort	<i>Met meet must criterion</i> ✓
<b>Package Unit with metal duct on ...:</b> Good comfort	<i>Met meet must criterion</i> ✓
<b>Split AC system with metal duct ...:</b> Good comfort	<i>Met meet must criterion</i> ✓

### Indoor Air Quality

<b>Ductless Mini Split (VRF) system:</b> Good indoor air quality	<i>Met meet must criterion</i> ✓
<b>Package Unit with metal duct on ...:</b> Good indoor air quality	<i>Met meet must criterion</i> ✓
<b>Split AC system with metal duct ...:</b> Good indoor air quality	<i>Met meet must criterion</i> ✓

### Flexibility for Future Change

<b>Ductless Mini Split (VRF) system:</b> very flexible for change	<i>Met meet must criterion</i> ✓
<b>Package Unit with metal duct on ...:</b> flexible for change	<i>Met meet must criterion</i> ✓
<b>Split AC system with metal duct ...:</b> not flexible for change	<i>Met meet must criterion</i> ✓

## 05. Advantages

### Ease of Constructibility

Want Criterion : want the simplest construction possible

Can be constructed in 1 month	Advantage: 5 months reduction in schedule	Most Important Advantage ★
Can be constructed in 4 months	Advantage: 2 months reduction in schedule	
Can be constructed in 6 months	Advantage: None	Least Preferred Attribute ✖

### Occupancy Comfort

Superior comfort	Advantage: better indoor comfort	Most Important Advantage ★
Good comfort	Advantage: None	Least Preferred Attribute ✖
Good comfort	Advantage: None	Least Preferred Attribute ✖

### Indoor Air Quality

Want Criterion : prefer better indoor environment

Good indoor air quality	Advantage: None	Least Preferred Attribute ✖
Good indoor air quality	Advantage: None	Least Preferred Attribute ✖
Good indoor air quality	Advantage: None	Least Preferred Attribute ✖

### Flexibility for Future Change

Want Criterion : want more flexibility for future change

very flexible for change	Advantage: more flexible for change	Most Important Advantage ★
flexible for change	Advantage: some flexibility	
not flexible for change	Advantage: None	Least Preferred Attribute ✖

## 06. Importance of Advantages

### Ease of Constructibility

Want Criteria : want the simplest construction possible

Alternative	Attribute	Advantage	Weight of Advantage
Ductless Mini Split (VRF)...	Can be constructed in 1 mo...	5 months reduction in schedule	100*
Package Unit with metal d...	Can be constructed in 4 mo...	2 months reduction in schedule	44
Split AC system with met...	Can be constructed in 6 mo...	None	
* Paramount Advantage			

### Occupancy Comfort

Must Criteria : must be comfortable

Alternative	Attribute	Advantage	Weight of Advantage
Ductless Mini Split (VRF)...	Superior comfort	better indoor comfort	60
Package Unit with metal d...	Good comfort	None	
Split AC system with met...	Good comfort	None	

### Indoor Air Quality

Want Criteria : prefer better indoor environment

Alternative	Attribute	Advantage	Weight of Advantage
Ductless Mini Split (VRF)...	Good indoor air quality	None	
Package Unit with metal d...	Good indoor air quality	None	
Split AC system with met...	Good indoor air quality	None	

### Flexibility for Future Change

Want Criteria : want more flexibility for future change

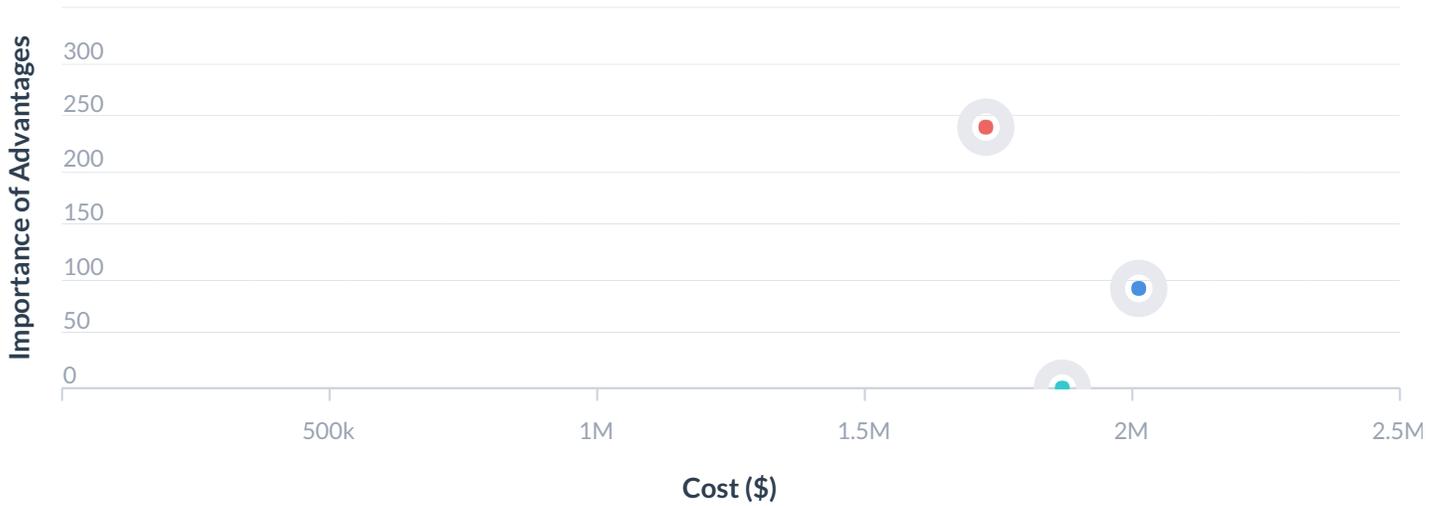
Alternative	Attribute	Advantage	Weight of Advantage
Ductless Mini Split (VRF)...	very flexible for change	more flexible for change	80
Package Unit with metal d...	flexible for change	some flexibility	48
Split AC system with met...	not flexible for change	None	

Split AC System with met... NOT FEASIBLE FOR CHANGE NONE

## 07. Costs

Alternative	Maintenance...	Energy Cost	Constructio...	First Cost	Category 5	Total*
Package Uni...	\$346,000.00	\$589,000.00	\$289,000.00	\$789,000.00	\$0.00	\$2,013,000.00
Split AC syst...	\$351,598.00	\$486,941.00	\$350,890.00	\$678,456.00	\$0.00	\$1,867,885.00
Ductless Min...	\$489,929.00	\$320,000.00	\$132,000.00	\$784,256.00	\$0.00	\$1,726,185.00

Importance of Advantages vs. Cost Graph



Alternative	Importance of Advantages	Cost
1 Package Unit with metal duct...	92	\$2,013,000.00
2 Split AC system with metal du...	0	\$1,867,885.00
3 Ductless Mini Split (VRF) syst...	240	\$1,726,185.00

Selected Alternative	Importance of Advantages	Life Cycle Cost
Ductless Mini Split (VRF) system	240	\$1,726,185.00

Final Notes

We chose the VRF system because it cost the least and offered the most important of advantages. The VRF system gives us flexibility for future change and allows us to reduce our construction schedule by 4 months.

Last Modified

May 29, 2016, 5:02 a.m.