

# Routes in Dynamic Segmentation

a.k.a. Linear Referencing

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Geog 575

## What is

## Dynamic Segmentation (DynSeg)?

- ❑ The Process of computing or plotting the locations of **Events** on a **Routes** (Nyerges 1990).
- ❑ *There are two Primary data types used in linear referencing:*
  1. *Route Feature Class*
  2. *Event Table*

## What are Routes?

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- ❑ **Routes** are linear features with a common linear measurement system stored with its geometry.
- ❑ **Route Examples:** Streets, Highways, pipelines, water/sewer, bike and bus networks, streams etc.
- ❑ A collections of routes is a **Routes System**.

## What are Events?

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- ❑ **Events** are linearly referenced data that occur along routes.
- ❑ **Event Examples:** Traffic Accidents, Sample Locations, Bridges, culverts, Mileposts etc.

## Route and Event Relationship

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- DynSeg Links events to routes and other geographically referenced data so the events can be displayed and analyzed.

## Understanding Routes

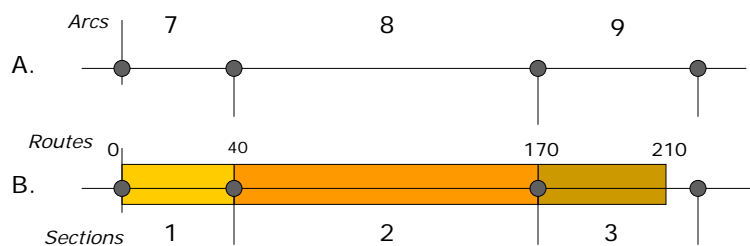
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- There are **2** built-in measurement systems with ESRI products.
  1. The Coverage data model.
  2. The Geodatabase Data Model

## Coverage Data Model

- The more complex data model.
- Treats routes as a sub-class in a line coverage.
- Based on the hierarchical structure of route, section, and arc.
- Also based on the geometric length of arcs.

## Coverage Data Model Cont....



Arc	Section	F-Meas	T-Meas	F-Pos	T-Pos
7	1	0	40	0	100
8	2	40	170	0	100
9	3	170	210	0	80

Section 3 = 170 + (length of arc 9) x 0.8, or 210

## Geodatabase Data Model

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- Simpler model.
- Treats routes as polyline feature class.
- Instead of sections, routes are stored as a linear (*m values*) in the geometry field.
- Therefore, routes feature classes have an x, y, and *m values* attached.
- The *m values* can be based on the geometric length of the line segments.

## Geodatabase Data Model Cont...

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Point	X	Y	M
1	X1	Y1	1
2	X2	Y2	40
3	X3	Y3	170
4	x4	y4	210

## Creating Routes


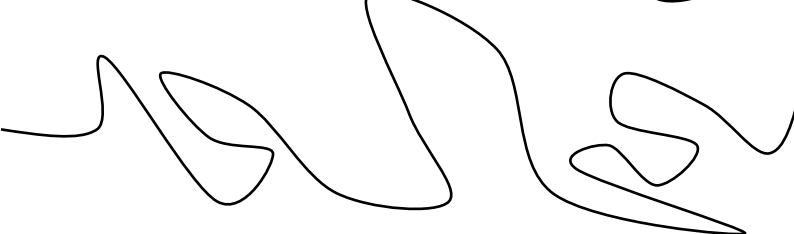

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- Routes can be created *interactively* or through *data conversion*.
- There are 3 type of routes:
  - **Simple Route:** A route that follows 1 direction and does not loop or branch.
  - **Combined Route:** A route joined with another route.
  - **Looping Route:** A route intersecting itself.

## Route Types

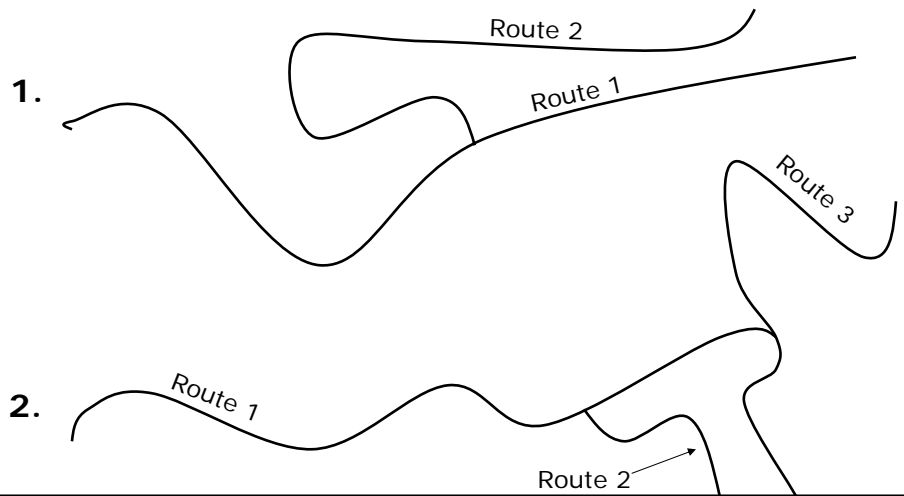
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### Simple Route:

1. 
2. 
3. 

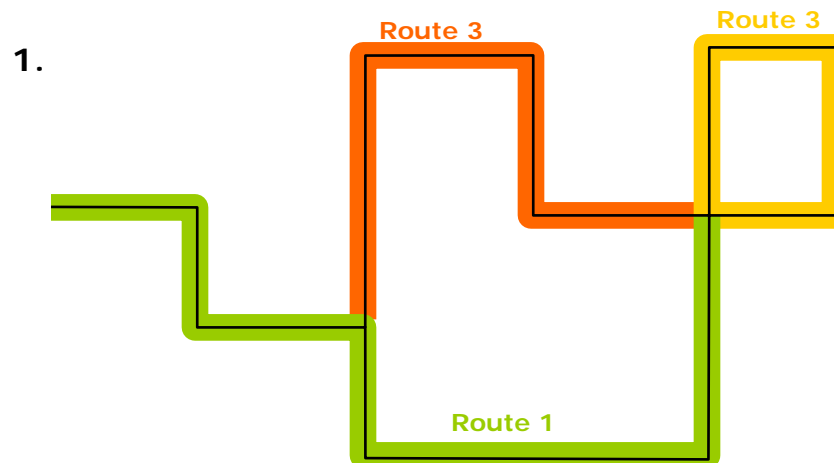
## Route Types Cont....

### Split Routes:



## Routes Types Cont....

### Looping Routes:



## Sources

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- Chang. 2008. McGraw Hill. Introduction to Geographic Information Systems, Fourth Edition. p. 363-366.
- <http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=welcome>

## Examples

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