# Case Study: FDOT

## Role of Simulations in Training

Linear simulations can be useful in direct teaching of skills to a novice, for example, a newly hired Roadway Characteristics Inventory Technician at the **Florida Department of Transportation**. It gets them up to speed quickly on targeted knowledge and skills while providing trainees with a rich and context-based learning.

However, branching simulations can further enrich the learning process by enabling trainees to explore and try out varying strategies. This is especially beneficial in more complex situations like making safe decisions on the road, planning their assigned schedules, information search, and problem-solving.

## Current Training

The current FDOT training is presented from the perspective of a new employee/trainee learning the ropes from senior RCI Technicians. The trainee is placed in several scenarios such as performing preparation activities in the office, interpreting technical documents, going out onto the road to collect roadway data, and entering the collected information into databases.



## Target Competencies

Research done prior to the development of the training courses indicated a need to target the following competencies:

- RCI Knowledge
- Measuring, Recording, & Verification Skills
- Computer Literacy Skills
- Information Search Skills
- Equipment Skills
- Safety Skills
- Planning & Organization (Soft skill)
- Teamwork (Soft skill)
- Interpersonal & Communication (Soft skill)

# How to Convert Linear to Branching Simulations

**Presenter:** Iskandaria Masduki
Center for Information Management & Educational Services
Florida State University

## Linear Simulations

The training focused on teaching highly technical and procedural content such as accurately measuring and recording roadway characteristics (i.e. medians and road shoulders). It is important for RCI Technicians from various districts all over Florida to learn the same procedures and apply the same standards of data quality. At the same time, the scenarios provided trainees with a rich learning context. Trainees learn to inventory roadway characteristics within a safe environment using 2D simulations of roadways and enter data into a software simulation without disrupting daily operations.
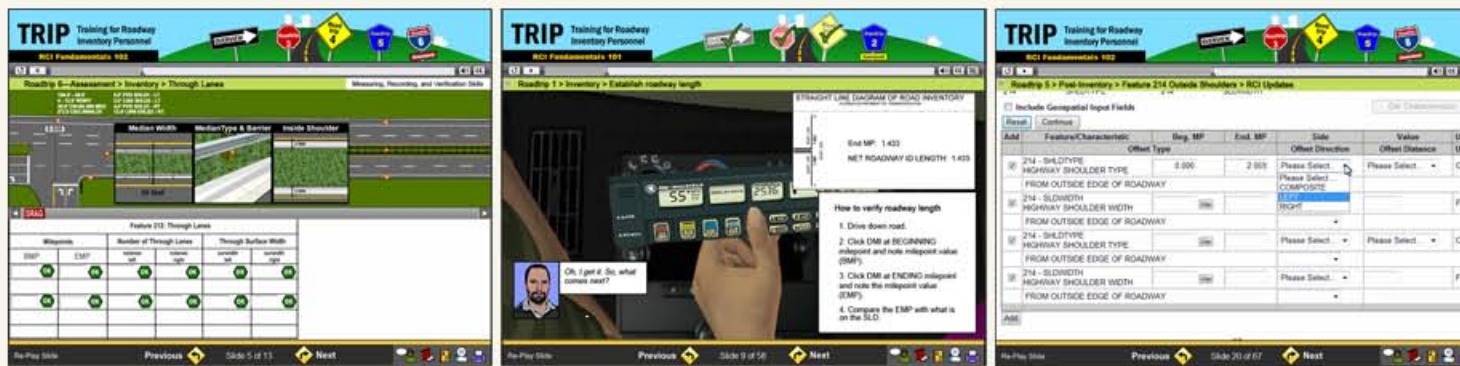


## Branching Simulations for Soft Skills

Soft skills like Safety, Planning and Organization, Communication, and Teamwork are good areas to convert from linear to branching simulations. Rich scenarios with multiple decision points leading to different outcomes can help shape trainees understanding and behavior. Trainees can be engaged through scenarios that highlight dilemma, conflicts, emotions, decision-making, consequences, resolutions, and discoveries.

## Example:

Currently, important safety skills are taught in a linear manner. Safety guidelines and safety tips are presented while the application of knowledge consisted of multiple choice questions on good safety practices.



Using branching simulations, however, a scenario can be created with the dilemma faced by a new trainee at being partnered with another technician who kept flouting safety guidelines such as not performing a vehicle check before going out on the road, not wearing a safety vest, being distracted with personal problems while driving, and not looking out for his partner's safety on the road.

The trainee is now faced with choices:
(a) ignore the problems with the partner (leading to fatal consequences)
(b) advise the more senior technician (who ignores the advice and instead bad-mouths the new trainee to other colleagues)
(c) report the problem to the supervisor (even though other co-workers might consider the action as snitching)



# Conversion Process

## Identify Opportunities for Branching

In this case, opportunities exist in the form of soft skills such as the application of safety skills, communication, planning, and teamwork. Branching can also be offered when trainees are being taught computing skills and information search skills.

## Review Learning Goals

Modify learning objectives to reflect *embedded content* (learning objectives strategically positioned in the story for trainees to discover through their choices).

Linear: Demonstrate ability to apply safety guidelines.
Branching: Demonstrate ability to recognize that
   a) safety for yourself and other road users is the most important thing
   b) Every person plays a role in creating a safe work environment.
   c) Ignoring safety guidelines can lead to terrible consequences.

## Identify the Branching Paths

Start by writing the story with the GOOD path or the ideal scene where the trainee made all the right choices and eventually reached the desired outcome or consequence.

Next, write the story for the BAD path where the trainee made all the wrong decisions leading to an undesirable outcome or consequence.

Lastly, write the story for the MEDIOCRE path where the choices are not ideal but neither are they wrong.

## Determine Scoring Criteria

In linear simulations, scoring is relatively straight-forward. In branching simulations, scores are determined based on the choices made - ideal, wrong, or somewhere in between.

The goal is to distinguish levels of performance between good, mediocre, and poor performance. Assign weights to choices, with the ideal choices having the most weight and poor choices having the least weight or no points at all.

# Challenges

## Matching learners' needs

Novice learners with no content knowledge or mental model of a domain may find branching simulations too confusing or overwhelming.

## Determining if branching is appropriate

Topics that involve conflict, consequences, communication, decision making, and leadership skills, for example, are great for branching simulations. Training content where application of proper procedures and standardized performance are desired may be better suited to linear rather than branching simulations.

## Creating believable stories and dialog

Some topics just lend themselves to great stories and dialog. Technical content, on the other, is more limited in terms of scenario progression through intriguing plots and conversations.