

The background of the slide is a screenshot from the game Company of Heroes. It depicts a war-torn urban environment with soldiers in green uniforms fighting on a street. A large, dark, rectangular structure, possibly a bunker or a large crate, is in the foreground. In the background, there are buildings, smoke, and explosions. The overall tone is gritty and realistic.

COMPANY^{of}HEROES

Theory into Practice:

Single Player RTS Design for Company of Heroes

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Overview

★ This lecture is NOT about:

- ★ Theory for the sake of theory
- ★ Academic approaches to Game Design
- ★ Creating Design Documentation
- ★ Company of Heroes 2



Overview

★ This lecture IS about:

- ★ Developing a set of “best practices” for Single Player mission development
- ★ The value of process
- ★ An approach to tools
- ★ Practical examples for single player game design

A look at how to empower designers through powerful tools, iteration, and guided through a collaborative process

The End Result

★ MOVIE SHOWING GAMEPLAY

- Opening to Mission 03 (end of NIS to gameplay transition)





Project Overview

★ Project Stats

- ★ Project duration = 43 Months (3.6 yrs)
- ★ Team size at start = 15
- ★ Team size at peak = 100+

★ SP Game Stats

- ★ Total Missions = 15
- ★ SP Game prototyping duration = 6 months
- ★ SP Game production duration = 12 months

★ Company of Heroes Accolades

- ★ GameRankings Score: 94.1%
- ★ Highest ranked RTS of all time, 5th highest ranked PC game of all time
- ★ Dozens of awards, including several Game of the Year, RTS of the Year, etc.

Resource Allocation

Breakdown of COH SP resources:

★ Design

- ★ % of Lead Designer's time
- ★ 1 SP Supervisor
- ★ 4 Experienced SP Designers (incl. 1 w/ CS background)
- ★ 2 Junior SP Designers
- ★ Lots of butter chicken

★ Programming

- ★ 1 Full-Time SP Support Programmer
- ★ Additional Programming support for SP features (e.g. UI)

Resource Allocation

★ Environment Art

- % of Art Director's time
- 1 Environment Art Supervisor
- 4 Environment Artists
- 1 Concept Artist (shared)
- 0.5 Environment Asset Artists (for unique SP art assets)

★ Cinematics

- 1 Cinematics Director
- 1 Animation Supervisor
- 4? Animators

★ Animatics / Mission Briefings

- 1 Animator/Concept Artist

Approach to SP Design

★ Create a Unique Experience:

- ★ Single-player is not solo MP
- ★ Single-player is not an extended tutorial for MP
- ★ Immerse the player in the action
- ★ Lots of variety

★ Gameplay as Storytelling

- ★ The 'story' does not stop when the cinematics end

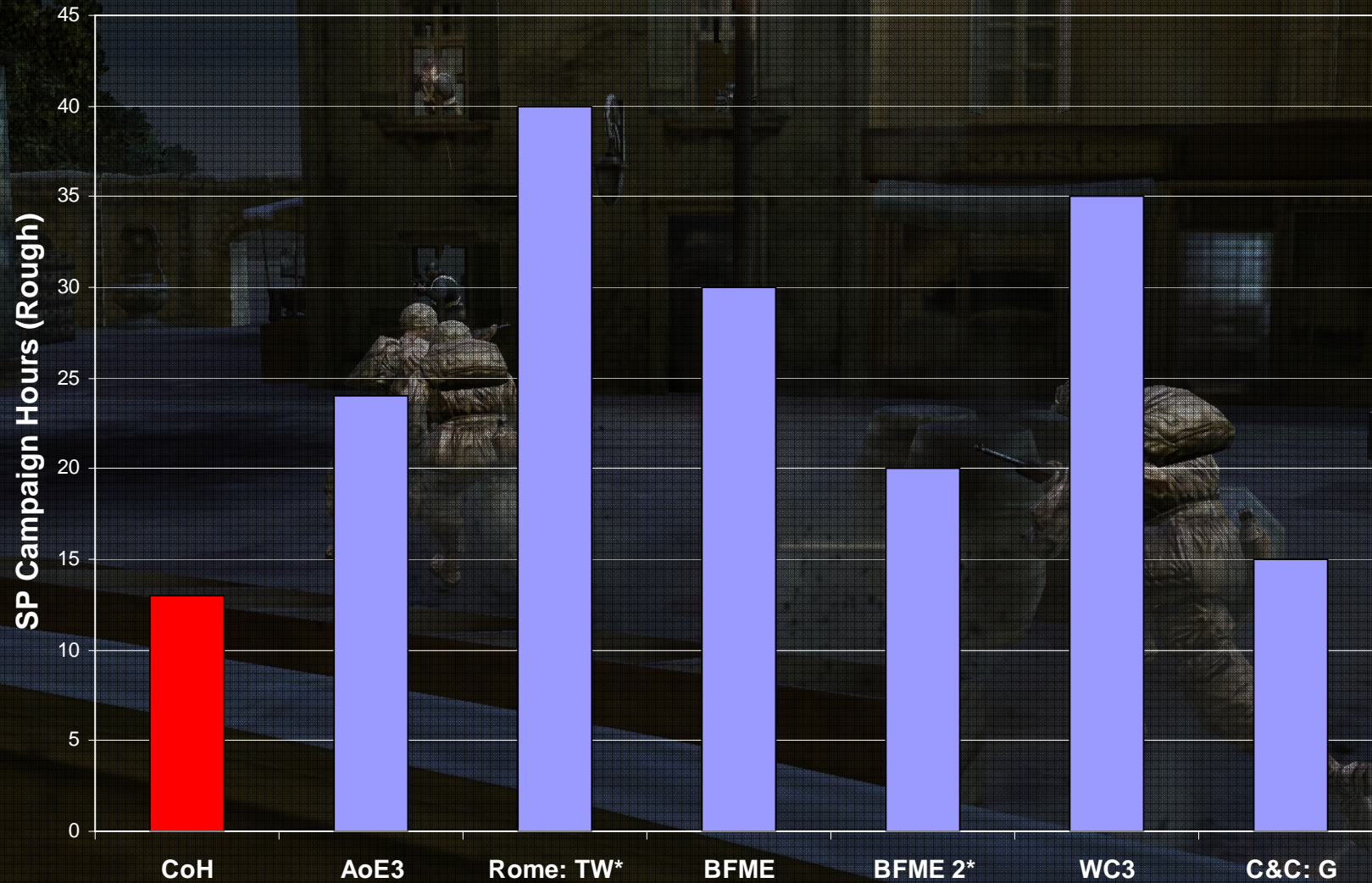
★ Execution over innovation

- ★ Memorable moments
- ★ Highly leveraged game mechanics

★ Shorter but more Engaging

- ★ Smaller amount of custom, highly-polished content

RTS Campaign Comparison



* Dynamic Campaigns (++ hours)

Approach to SP Tools

COH Single-Player was developed with:

- ★ SCAR (lua-based scripting language)
- ★ World Builder
- ★ Attribute Editor

Data-Driven tools mean more power in the designer's hands:

- ★ Faster Iteration with little programming support
- ★ Ability to create custom content

Why Use a Scripting Language?

★ Easy to Use (relatively)

- ★ Anyone can learn, don't need a CS degree

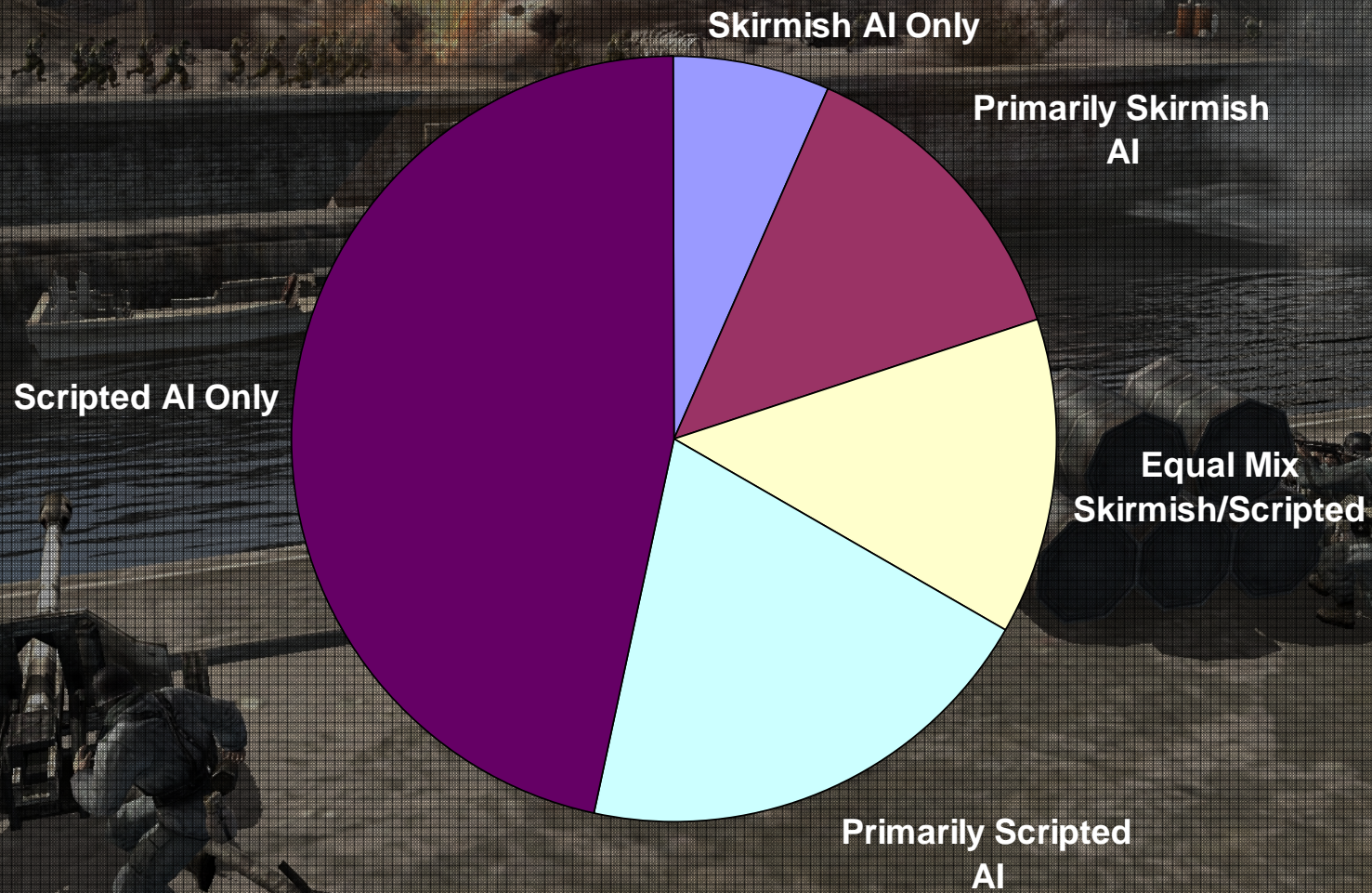
★ Hugely Powerful - Empowers Designers

- ★ Designers can create a lot of unique gameplay / content with a small amount of programming support
- ★ Great for prototyping / experimenting
- ★ Create your own objective types, enemy behavior, etc.

★ Easily Extensible & Re-Usable

- ★ Usually easy to link into core game code
- ★ Adding small functions can give big benefits
- ★ Can re-use underlying structure between projects (CoH SCAR was built on DoW SCAR)

COH Missions Breakdown - Scripted AI vs. Skirmish AI





Devils in the Details: Mission Design

What makes a great RTS mission?

★ Memorable Moments

- ★ “A Good Movie Needs 3 great scenes and none that suck”

★ Contextualization and Immersion

- ★ Remove/De-Emphasize gamey, un-contextualized elements
- ★ Emphasize immersive elements

★ Bend/Break the Rules

- ★ Use but don't be limited by MP if it helps create unique, compelling gameplay
- ★ Highly leveraged game mechanics

The goal is to craft a unique experience for the player

Devils in the Details: Mission Design

What makes a mission an unique “experience”?

★ Story:

- ★ Cinematics of the sake of the mission, not for the sake of the Cinematics
- ★ <video>

★ Aesthetic Integration:

- ★ Environments need to feel like real places, not abstract locations
- ★ Art needs to be involved in the underlying layout, not just set dressing
- ★ <image>

Devils in the Details: Mission Design

What makes a mission an unique “experience”?

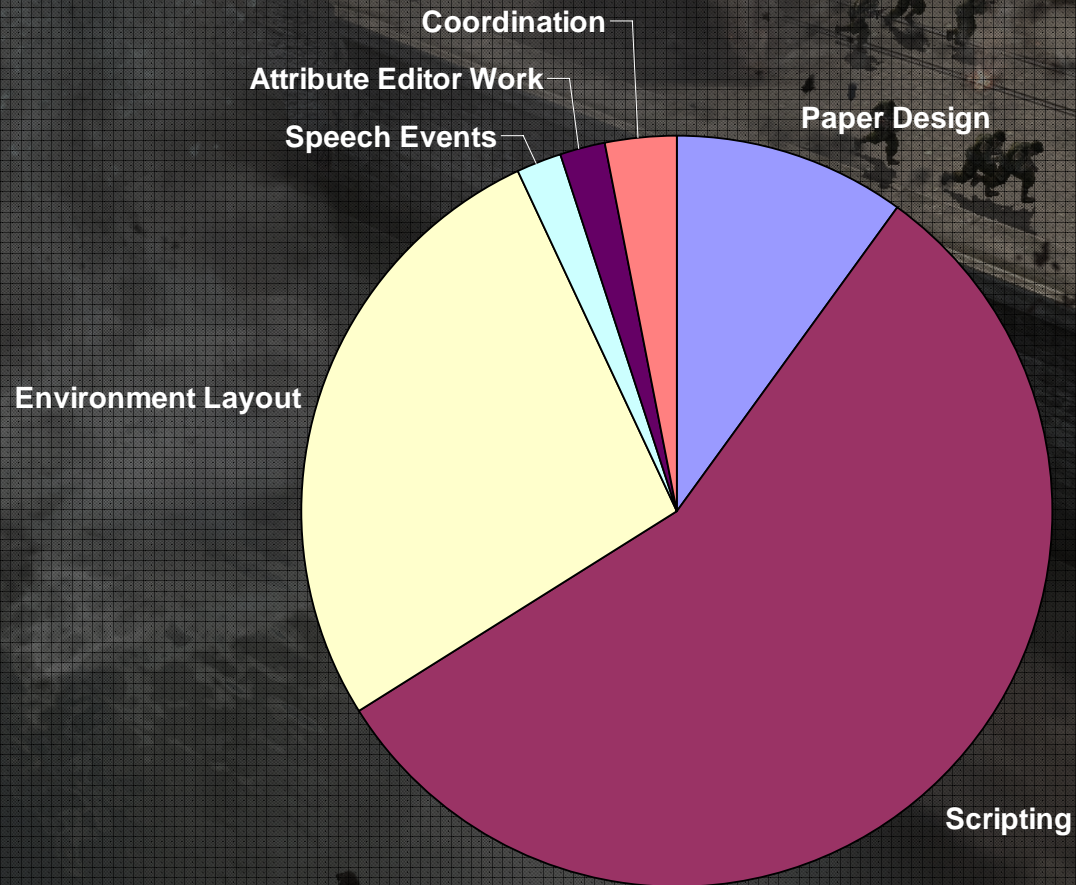
★ Variety is Key

- ★ Vary environments and core mission gameplay
- ★ <image>: screenshot grid showing all COH missions

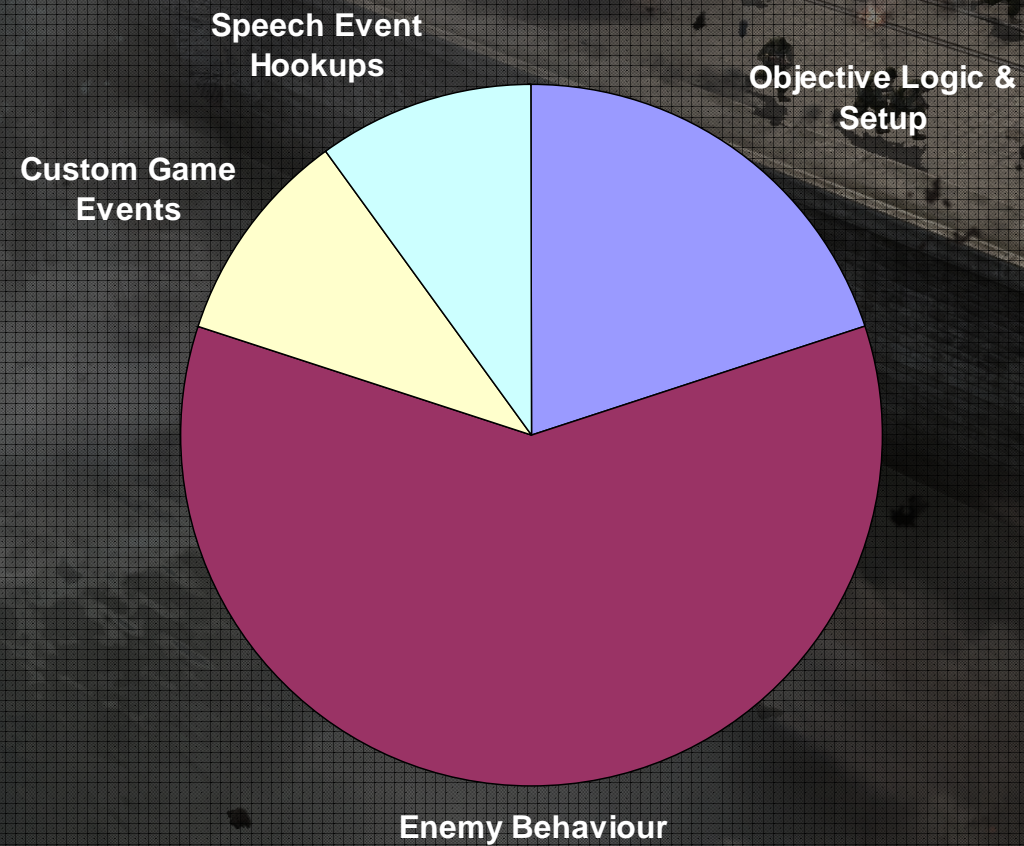
★ LOTS of custom content

- ★ Custom objectives, game events
- ★ Custom enemy behavior
- ★ Custom Speech
- ★ <video>: enemies retreating (ADD FRAPS of PaK38 near the CHURCH.

CoH Mission Workload Breakdown



CoH Mission Scripting Breakdown



Concept to Completion



★ Process at a High-Level:

- Minimal Paper Design
- “Goal”-based Iteration
- Collaborative Process

Paper Design

★ The Design Mantra: Minimal Paper Design. Why?

- ★ Documentation is a starting point not an end point
- ★ Break old patterns of linear “mission design”
- ★ Create compelling moments, not just gameplay for the sake of gameplay
- ★ It’s all in the execution

★ The Process:

- ★ One-Pager created by Lead Designer and iterated by Producer and Art Director.

★ Boil mission down to KEY MOMENTS

- ★ Once everyone “buys” into One-Pager, a Designer is assigned to the mission and creates the detailed design.

★ Example One-Pager

Paperless Mission Designs

Interactive HTML image documents vs. linear paper designs.

- ★ Acted as 1st 'Prototype' of the Mission.
- ★ Encouraged feedback
- ★ More visual = more accessible
- ★ [Mission 01 "Paper Design"](#)

Anatomy of a Memorable Moment

What makes a Memorable Moment?

- ★ Unique
- ★ Defies Expectations
- ★ Contextual
- ★ Leverages underlying game mechanics to maximum effect
- ★ Leverages best technical / artistic features of the game
- ★ Requires Player Action / Offers Rewards



Anatomy of a Memorable Moment

“Town Hall Attack” Carentan Counterattack Mission



Town Hall Attack

An aerial view of a town hall attack. In the center, a large building is being destroyed, with a massive explosion and smoke plume. Several soldiers in green uniforms are running towards the building. To the left, a two-story building with a tiled roof is visible. The ground is littered with debris and smoke. The overall scene is chaotic and depicts a military assault.

Screenshot of SIT-REP
showing town hall

Screenshot of TOWN HALL
Collapsing

Screenshot of M04 SCRIPT
showing town hall

Screenshot of arty 2

Town Hall Attack

An aerial view of a town hall attack. In the center, a large explosion of smoke and debris is rising. To the left, a two-story building with a dark roof and several windows is visible. To the right, a group of soldiers in green uniforms are running towards the town hall. The ground is covered in dust and debris. The overall scene is chaotic and depicts a military assault.

Screenshot of arty 1

Screenshot of AXIS moving in
TOWARDS the TOWN HALL

Screenshot of AFTERMATH
showing town hall

Screenshot of TOWN HALL
in RUINS

Deconstructing a Memorable Moment

★ Concept:

- ★ Developed during the iterative process
- ★ Not part of the original design. Living proof that you cannot rely solely on documents.
- ★ Evolved from gameplay and playing the mission

★ Execution:

- ★ The Town Hall sequence required a significant amount of custom content.
- ★ This was only possible because the designer had the tools to make this happen
- ★ Scripting the Town Hall sequence did not require special-case code. Re-used everything that was already available for MP

Under the Hood

Under the Hood: Custom Elements

★ Unique Weapons and MP Data:

- ★ Makes use of a customized weapon (single artillery strikes)
- ★ <reference>: Attribute Editor – creating custom SP weapons

★ Custom Markers:

- ★ Makes use of custom target markers placed in the WB for placing the strikes
- ★ <reference>: WorldBuilder – show target markers

★ Scripted Events:

- ★ Makes heavy use of a scripted set of events developed with SCAR
- ★ <reference>: M04 SCAR script – Artillery section

★ Speech:

- ★ Makes use of custom speech events
- ★ <reference>: M04 SCAR script – Artillery speech events

Iterative Process

★ Approach to Designers

- ★ Designers are generalists, not specialists. Have a wide variety of tasks:
 - Paper designs
 - Environment Layout
 - Scripting
 - Speech events
 - Integration & Coordination w/ other depts

★ Phase System

- ★ Benchmark missions
- ★ Goal Based Iteration
 - Show Excel of the Process
- ★ Frequent mission review meetings
- ★ SP Supervisor & Lead Designer playtest frequently / add to backlog
- ★ Mission Backlogs for tracking tasks
 - Show Backlog example
- ★ Brown bag lunch sessions for feedback from design team

★ Support Systems

- ★ Programmer
- ★ Role of Lead Designer and Art Director

Art Integration

★ Key Process Elements

★ Pre-Production

- Early concept art helps shape mission 1-pagers
 - <image>
- Paper Design Phase = Full Layout Concepts
 - <image>
- Phase 1 Layout → Art creates overpaints
 - <image>
- *Art needs to be heavily involved in the underlying layout of the mission*

★ During Production

- Each mission assigned to an Environmental Artist
- Hand maps back and forth between art and design → Handoff meetings
- Art creates overpaints as missions progress to further guide aesthetics
 - <image>
- Design creates overpaints to communicate gameplay-critical areas
 - <image>
- Art Director & Env. Art Supervisor review progress frequently with Env. Artist
- Art Director, Env. Art Supervisor & Env. Artist attend mission signoff meetings

Recommendations

★ **Make Single Player Unique and Compelling**

- Memorable moments
- Custom content
- Highly leveraged game mechanics
- Art involved early and at a structural level

★ **Empower Designers**

- Scripting Language or similar powerful, flexible tool
- Data-Driven tools for modifying MP content/mechanics
- At least 1 full-time dedicated SP support programmer

★ **Iterative Process**

- Create benchmark missions
- Frequent reviews, iteration with milestones
- Backlogs for tracking tasks & ideas



Questions?