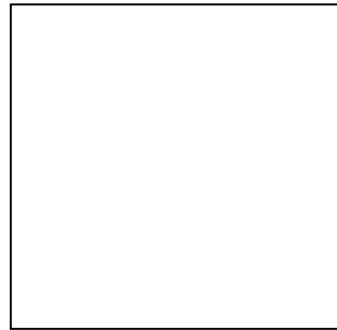


Deliverable 5

Review: Final Concept and Model

Team GM2



Lane Ballard

Amber Mazooji

Tom Burns

Minja Penttila

John Celmins

Chris Piscitelli

Paul Glomski

Tomer Posner

Agenda

Mission statement review

Customer needs

- **Market focus**
- **Customer needs**
- **Design tradeoffs**

Concept sketch

Prototype

Q&A

Mission Statement Review

Primary Market

- Current and future Cadillac SRX customers with rear-seat passengers
 - Customers with children
 - Business customers (e.g. corporate-owned vehicles)

Secondary Market

- Future customers of other Cadillac vehicles
 - Deville, Escalade, and others

Assumptions & Constraints

- The tray table will be **installed by the dealer**
- The tray table will be **safe**
- The design will maintain or enhance **Cadillac styling**

Stakeholders (Cadillac brand, dealers, etc.) and business goals (differentiate from competition, serve market size of 200,00 units) have not changed.

Market Focus and Customer Needs

Customer Interviews

- Age:
 - % Time as passenger:
 - Type of vehicle:
 - Role (circle one): purchaser / influencer / end user
1. Are there any features you would like to add to the back seat of your car?
 2. What types of things do you do while riding in the car?
 3. If there was a table in your car, what would you use it for?
 4. Do you have any concerns about having a table in your car?
 5. Have you used a tray table on an airplane? Can you describe it?
 6. What did you use it for?
 7. What did it do well?
 8. How would you improve it?

Internet Survey

1. Please RANK these features in order of IMPORTANCE.

2. What one improvement would you most like to see in the back seat tray table?

3. How interested are you in a car with a back seat tray table?

Extremely Uninterested Uninterested Neither interested nor Uninterested Interested Extremely Interested

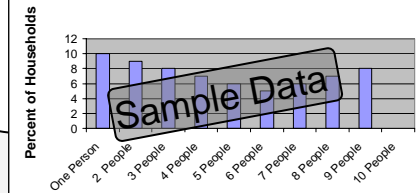
SUBMIT

Dealership Interviews

Vehicle Inspection

GM Market Research

Number of people in the Medium Luxury Utility Households



Critical Customer Needs

The tray table will...

- maintain or enhance the look of the interior
- not restrict comfort of backseat passenger
- be sturdy & durable
 - Target weight bearing capacity – 15 lbs
 - Maximum deflection at tray edge – ¼" under predicted 10 lbs. normal usage weight

Target Market

Families with young children who...

- draw,
- eat,
- and use portable electronics

Secondary audience:

- Business traveler

Several concepts were generated to balance customer needs AND constraints.

Safety

Comfortable and easy to operate

AND

Protects passengers from injury during collision or hard braking

Installation

Enhances interior of car

AND

Can be installed at the dealer without major modifications

Cost

Meets high Cadillac standards

AND

Can be purchased and installed for ~\$400.00

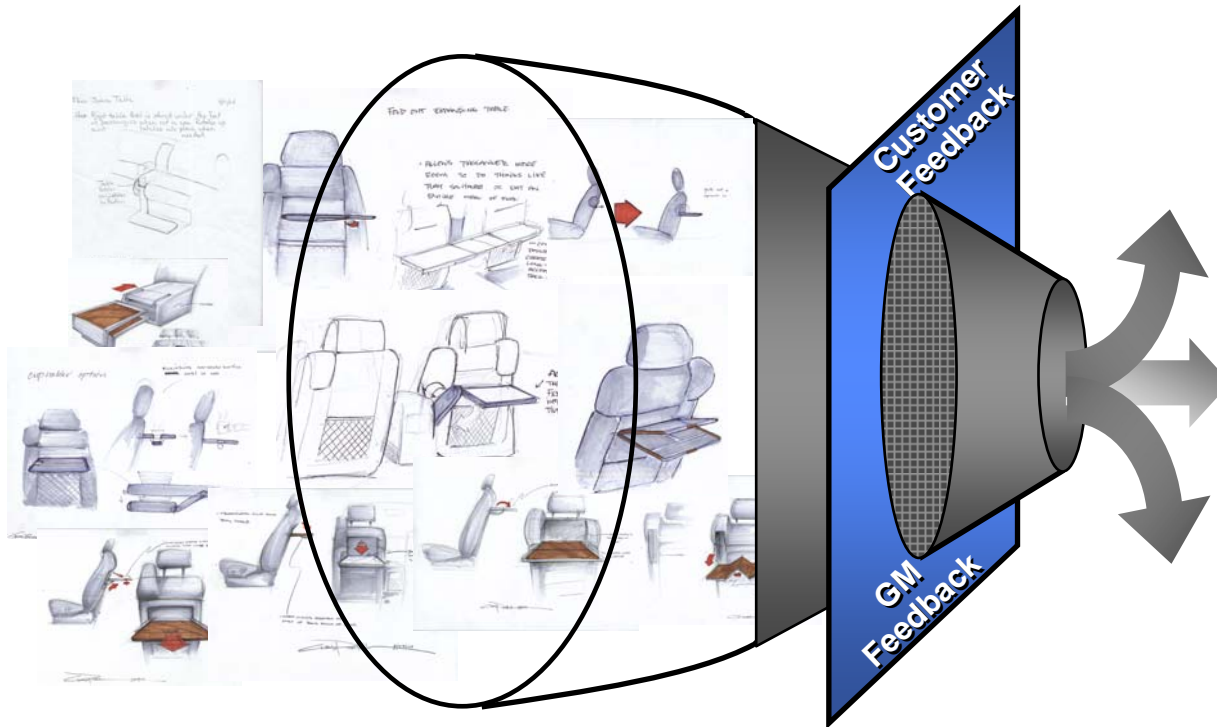
Personalized fit

Adjustable to fit a small child

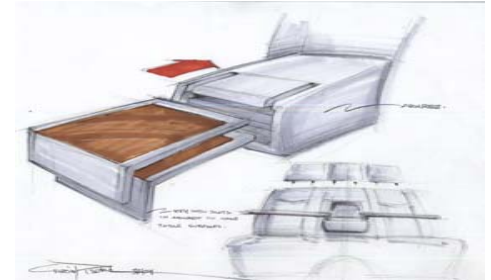
AND

The occasional business traveler

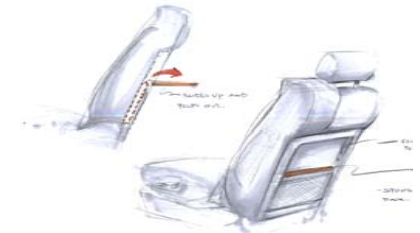
Design tradeoffs focused efforts on three concepts*.



1. Rear Armrest



2. Seat-back



3. Center Console



*Other concepts considered are shown in the Appendix.

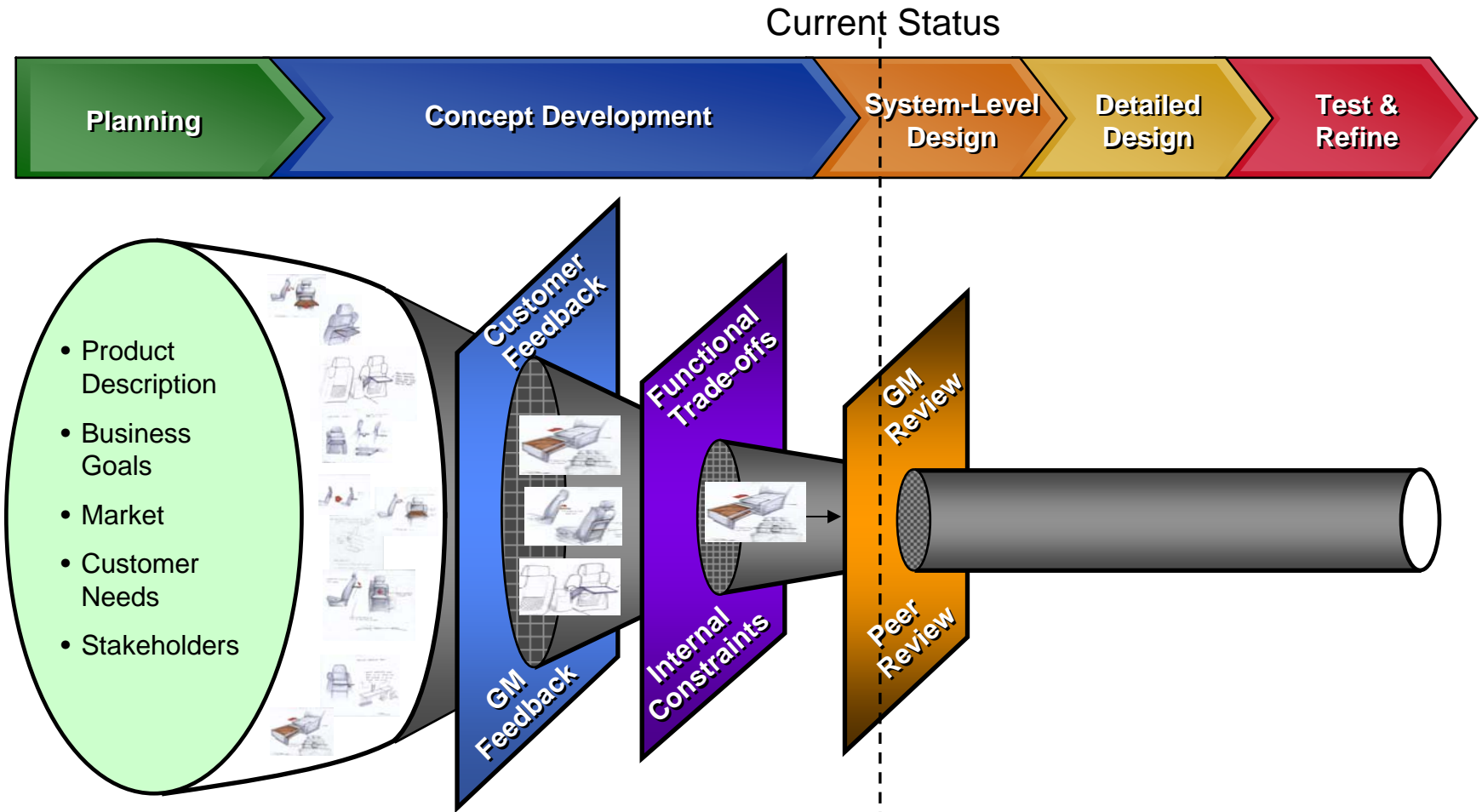
Further input from customers and GM led us to a single concept.



The table mount folds into the rear arm rest.



Although we follow a structured process, we are still receiving data and feedback that may cause iteration.



Deliverables

<ul style="list-style-type: none"> • Mission Statement • Customer Needs List 	<ul style="list-style-type: none"> • Concept Sketches • Target Specifications 	<ul style="list-style-type: none"> • Selection Criteria • Final Concept 	<ul style="list-style-type: none"> • Peer review • Conceptual Prototype 	<ul style="list-style-type: none"> • Drawings & BOM • Revised Plan 	<ul style="list-style-type: none"> • Alpha Prototype • Financial Model
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Next steps and challenges are focused on detailed design and development of an alpha prototype.

Complete Assembly Drawings

Complete Materials & Component Selection

Build Alpha Prototype and Test

Complete Financial Model

Present & Demonstrate Final Product

Questions?



“GM’s future success will depend on our ability to develop and rev up new engines for growth. That means ... delighting our customers with innovations the competition doesn’t have.”

G. Richard Wagoner, Jr.

Process Comments

Process Reflection

- The major reasoning was the lack of knowledge of the team regarding the structure of the rear-seat passenger surroundings. Since we didn't have access to detailed drawings of the seats and passenger areas, as well as the physical seats, the design which allows the least interference with the existing structures was most appealing.

We were advised by the Cadillac dealers and Lear engineers that the rear-armrest would be easy to remove and replace. Considering all these factors, the team decided to pursue the rear-armrest idea.

- We came up with 2 rather promising final concepts. One would be categorized as more technologically innovative and a more integral design. The other would be categorized as more technologically conservative – yet more robust in its implementation. Ideally, we would have created mock-ups and even prototypes for both. This experimentation would've helped us get a better “feel” for the potential product, and enabled us to collect user opinions. However, due to the time restrictions we are under, we decided to go with the “safer” design – that is – the one we were more confident we could implement in practice.

Group Meeting – 3/8/2004

- The team reviewed the results of concept selection matrix, from which 2 general design ideas stood out. The first was the rear-armrest location and the second was the back of the front seats.
- A decision was made to pursue the rear-armrest location (see process comments above).

Group Meeting – 3/11/2004

- Team members brought to the table more concept ideas they had generated for the rear-armrest. These were discussed, and it was decided that an additional meeting was needed to finalize a concept decision. For this meeting some promising designs would be drawn and described in higher detail.

Group Meeting – 3/13/2004 – Final Concept Generation

- Two final concepts were analyzed in greater detail, and the merits of each were discussed at length. The team converged and agreed on a single final concept. Drawings and descriptions were to be generated.

Advisor Meeting – 3/16/2004

- On March 15th Amber and Lane met with Professor Whitney to discuss the status of our current concept. He was impressed with the engineering nature of our design, but was curious on how we plan to make it aesthetically pleasing. He also had some concern on the safety aspect of keeping tray tables in front seat map pocket. These concerns were passed on to members of the team.