Sample Guide to Coastal Adaptation Strategies

Natural Solutions

**Remove Invasives**
- **Advantages:** Supports marsh ecosystem health & function. A healthy marsh provides storm protection, erosion control, and supports wildlife habitat.
- **Potential Challenges:** May not be ecologically appropriate. Requires maintenance.

**Shoreline Continuum**
- **Advantages:** The continuity of coastal habitats from sub-tidal waters to upland buffers provides long-term protection and maximum co-benefits.
- **Potential Challenges:** Requires space and time to fully establish. Limits coastal development.

**Dune/Beach Complex**
- **Advantages:** Beaches and vegetated dunes combine to attenuate wave energy, reduce erosion, and slow inland water transfer.
- **Potential Challenges:** Changes shape over time. Dunes are fragile and susceptible to human impacts.

**Gray Infrastructure**

**Revetment**
- **Advantages:** Rocks or other material placed on a sloping shoreline to stabilize the shore and to mitigate wave energy.
- **Potential Challenges:** No major flood protection. Prevents upland sediment transport to estuarine habitats.

**Bulkhead**
- **Advantages:** Vertical wall suitable in high-energy settings; stabilizes shoreline and reduces flooding.
- **Potential Challenges:** Can erode adjacent areas. Prevents upland sediment transport to estuarine habitats.

**Jetty**
- **Advantages:** Prevents beach erosion and reduces wave energy by intercepting the flow of water and sand along the shoreline.
- **Potential Challenges:** Can erode adjacent areas. Prevents upland sediment transport to estuarine habitats.

**Policy Strategies**

**Zoning**
- **Advantages:** Utilizes zoning overlays to limit development in flood-prone areas (legal precedent exists in MA).
- **Potential Challenges:** Can impact property tax base. May lead to legal challenges.

**Climate-smart Development**
- **Advantages:** Requires SLR to be considered in development proposals. Promotes open spaces to increase flood resiliency.
- **Potential Challenges:** Creates additional work for developers up front. Doesn’t require action.

Nature-Based & Hybrid Strategies

**Oyster Castles**
- **Advantages:** Concrete structures that support oyster restoration to enhance water quality, reduce erosion, and buffer wave energy.
- **Potential Challenges:** Overtopped by major storms. Easily damaged by debris and ice.

**Edging**
- **Advantages:** Natural vegetation combined with engineered structures parallel to coastline; reduces erosion and wave energy, and enhances wildlife habitat.
- **Potential Challenges:** Limited storm surge reduction. Requires more land area to implement.

**Bioswales**
- **Advantages:** Absorb and filter storm water runoff; improve water quality by preventing pollutants from entering streams and rivers.
- **Potential Challenges:** Requires time for vegetation to fully establish. Requires irrigation.

**Smart Development**
- **Advantages:** Market-based approach (with existing MA guidelines) that incentivizes development away from flood prone areas.
- **Potential Challenges:** Can be costly and complex to implement. Requires calibrated market.