Climate Resilience Zoning Task Force, April 2019
Discussion Framework: Flooding Predictions, Impacts, and Development Strategies

	Flooding Projections	**Flooding Impacts**	**Land Use and Development Strategies**
Questions for Task Force	1. What type of flooding should this process focus on? 2. What levels of flooding (e.g. % storm per time horizon) should be prioritized for protection and/or recovery?	3. What flooding impacts should this group focus on? What flooding impacts are of most concern?	4. What strategies might property owners employ to mitigate flooding impacts, and what are the relevant benefits and costs of these strategies?
Key concepts and content for consideration	*Relevant content from the city's Climate Change Vulnerability and Adaptation work* Key types of flooding facing Cambridge: • Precipitation/riverine: ○ More immediate issue, likely to intensify over time ○ Effects in areas scattered throughout city ○ Infrastructure for storage/drainage is a significant factor • Sea level rise/storm surge ○ Not a significant issue until mid-century ○ Effects primarily in Alewife area ○ Infrastructure factors include dams, barriers (storage/drainage has limited effect) Modeling time horizons used in the CCVA: • 2030 predictions: more immediate • 2070 predictions: longer-term, based on no action taken, could change if improvements are made The CCVA modeled different elevation probabilities in the 2030 and 2070 time horizons: • 10% / 10-year: likely to recur during building's lifespan • 1% / 100-year: happens rarely during building lifespan • 0.2% / 500-year: possible, but not likely, to occur during building lifespan (not studied in CCPR) Flooding duration: • Likely less than a day at predicted levels • Could vary depending on duration of event, reliability of infrastructure	*Examples of types of possible flooding impacts* Impacts to buildings/uses (existing and new): A. Electrical/mechanical system failures B. Damage to structures and/or contents from water – potentially intensified by salt water in storm surge C. Differing considerations based on use type: a. Residential: emergency services, access, habitability during power outage, exposure to mold or contaminants if residential units flood b. Commercial: business closure, loss of goods c. Parking: damage to vehicles, contamination d. Hospitals, police, fire: continuity of emergency services Broader impacts (beyond parcel-scale): D. Sewer/stormwater service E. Electric/gas/other utilities F. Street usability/accessibility (pedestrians, bicycles, vehicles, emergency vehicles) G. Public transportation services H. Emergency services	*Land use scenarios for which this Task Force's work could apply:* • Continuation or alteration of existing buildings and uses ○ Not making change (with its own impact) ○ Protecting what exists ○ Making changes (which make impacts better or worse) • Redevelopment of individual sites / new projects ○ Best practices for new projects • Large-scale planned redevelopment ○ Opportunities in larger projects that involve infrastructure and public amenities *Strategies (refer to CCPR Preparedness Handbook):* • Elevate structures or specific uses/functions (e.g., utilities) • Flood-proof structures ("dry floodproofing") • Provide floodwater storage on site (e.g., compensatory storage) • Provide stormwater storage or infiltration (e.g., DPW detention/retention standards) via grey or green infrastructure • Use materials that can withstand flooding ("wet floodproofing") or be repaired/replaced • Install pumps to prevent water from getting in or remove it • Install backup power or utilities (e.g. generator, on-site solar/battery) • Design for "passive resilience" to maintain life safety and comfort (e.g. ventilation, heating/cooling) without power • Provide community facilities at a building or neighborhood scale • Provide planning or programming for emergency shelter, support services, evacuation • Design to enable buildings and sites to adapt to future conditions (e.g., taller ground floors that can be built up, ability to convert electrical/mechanical systems) *Benefits, costs & considerations re: land-owner strategies to address flooding* • Temporary vs. permanent measures • Where to protect (which timeframe, probability, type of flooding) • What uses need what level or type of protection? (e.g., residential, commercial, utilities/mechanicals, parking, emergency facilities) • Level of difficulty of implementing • Co-benefits such as mitigation or open space • Resilience impact • Cost to implement • Trade-offs with other planning goals such as housing, urban design & economic development.